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ABSTRACT

The proceedings of the fifth annual meeting of the College Reading Association, held in 1962, consisted of the following papers: (1) "President's Report to the College Reading Association" (Albert J. Mazurkiewicz); (2) "Medical Aspects of Written Language Disability" (James J. Smith); (3) "Research and Secondary Reading" (Margaret J. Early); (4) "Results of Experimentation on the Wood Reading Technique" (William Liddle); (5) "Readability: Current Approaches" (Jeanne Chall); (6) "A Reading Program at the Secondary Level" (Edward J. Gallagher); (7) "A Junior College Reading Program" (Paul E. Nagy); (8) "Emphasizing Study Skills" (Walter Pauk); (9) "When Should the Classroom Teacher Consider Referral?" (Dorothy E. Withrow); (10) "Problems in Training Reading Specialists" (Marjorie S. Johnson); (11) "The Paperback in the High School" (Joseph Mersand); (12) "Instrumented Approaches with Kits" (Stanford E. Taylor); (13) "The Philosophy Behind the Machine Approach to Reading" (Mabel S. Noall); and (14) "Programed Instruction and the Improvement of Reading" (David A. Sohn). (MS)

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of

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Edited

by

Clay A. Ketcham

Director of Reading and Testing

Lafayette College

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COLLEGE READING ASSOCIATION

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PREFACE

The College Reading Association held its fifth annual meeting at New York University, New York City, on April 14, 1962. The program included two symposia, special reports on current research and several papers on current problems. At a business meeting at the close of the session, the following were announced to serve as officers for the coming year.

Mrs. Herbert E. Ketcham, President
Mrs. Martha Maxwell, President-Elect
M. Jerry Weiss, Director
Charles Colvin, Director

PRESIDENT'S REPORT
TO THE
COLLEGE READING ASSOCIATION

Albert J. Mazurkiewicz
Lehigh University

During the past two years in the presidency of the College Reading Association, I have been primarily concerned, as I see it, with activities and associations which can best be described by the label: professional. Judging by these particular activities and associations which have indeed been rewarding, it is my belief that professionalism in reading has been slowly growing, but that in the larger sense, if viewed by the activities of individuals practicing the specialty of reading, professionalism in reading is in a sad state.

The past seven years have seen the emergence of ideas which have produced such controversies that they have been labelled by various writers as revolutionary. Critical examination of the ideas does not permit that conclusion unless the concept of revolutionary is extended from "marked change" to "any development that upsets the established order." These ideas have upset the established order, not only in beginning reading, but also along the entire continuum of reading instruction, be it corrective or developmental. It is interesting to note that few of these ideas may properly be credited to a member of the profession, and that in most cases the revolution has come from outside the field, though the people involved might have been tenuously related.

Starting with Flesch and his attack on word recognition, in the days before sputnik, the ideas that were presented resulted in emotional reaction and outright rejection, rather than the thoughtful consideration which might be expected from a field that stresses, as a goal of instruction, critical reading and thinking. Looking over the activities of people in the field following the introduction of these ideas, one finds it interesting to note that many of the ideas have been put into practice with no credit given the critics responsible for changes. A conclusion about the level of maturity of the so-called professional is possible.

It seems apparent that some of this rejection of ideas has been a reflection of the economic ties that members of the reading specialty have with the procedures and materials being criticized. Rejections from such sources should necessarily be considered as biased. I point to the fact that most basal series do not begin to show royalty profits for five to eight years after their introduction and that revisions may be expected to be resisted until diminishing profits warrant another expenditure of time and effort. Similarly the touting of one approach as better, sounder, more efficient, needs to be examined with its source and the likely profit motive in mind.

The profit-motif also seems to have affected the statements of members of the college Reading Association in relation to the very emotional rejection of one profit-laden speed reading technique. Only a precious few of us seem to have been professional enough to pay the admission fee for a first hand look and to make judgements on experience-fact grounds.

This rejection of ideas certainly has been based on incomplete assimilation of research findings as well as on a lack of a critical examination of research done by the specialist-gods of yesterday whose findings yesterday were and are open to question, not only in relation to the sophisticated research techniques and more recent findings of today, but also in relation to the limitations of the studies when they were performed.

Too few of the critical examinations which exist in reading research seminars are made known or acted upon. Too few studies are replicated so that a sound basis for the use or rejection of a given procedure is established. Too little practical application of research to the problems of the classroom is demonstrated to the neophyte teacher.

Ideas proposed and rejected have been based, I am sure, on the tendency of the human to develop a specific frame of reference and to accept these findings which agree with the point-of-view established by this interest and reject findings which do not support the point of view learned at the foot of the Master or developed over a period of study. I refer to the tendency of specialists to ride their own hobbies.

We have been vulnerable to criticism and remain so. We are open to criticism in the area called diagnosis where serious shortcomings of approach are evident in the analysis reports of clinics and centers. If we may judge by last year's Logan report on course content and techniques, on the practical value of the training which teachers have received, we are, as teachers of teachers, vulnerable to criticism. In spite of our shortcomings as a profession, we, as reading specialists, have made major contributions to the education of the citizen and these should not be minimized. My report does not pretend to recognize the contributions of the reading specialist. It is intended to recognize the need for continuous attention to the business of professionalism and, in this report, it paints a bleak picture to stimulate further action.

Action is called for on the matter of a theory of reading, on the definition of the term reading specialist, on establishing procedures for effective training of the teacher of reading, on establishing the irreducible minimum in reading instruction, standards for the training of specialists, reading analysis standards to insure that we are seekers of truth, and so on.

The challenges implicit in criticism should be goals to thought and action. A re-examination of bases for activities, for beliefs held, should be the expected rather than the exception. Criticism should not result in a paranoid organization of committees to hunt down foreign paid witches thought to have conspired to destroy American education or to investigate the belief that the entire field of journalism has been subverted and led into a conspiracy to destroy reading instruction as the basis for destroying education.

Implicit in critical reading is the recognition that personal bias can be a factor in rejecting ideas. Implicit too is the necessity to teach students to hold in abeyance any conclusion until all facts are examined, to teach that conclusions held at one time should be expected to be modified as new facts are presented, and to teach that holding to conclusions for the sake of being consistent is negative behavior, for such consistency is the hobgoblin of little minds. As professionals in a profession growing in value and importance yearly, such consistency is unwarranted.

The growth in the scope and quality of various school reading programs has not come about as a result, primarily, of activities of personnel at the college or university level. Indeed the textbooks which have been produced and which reflect thinking and activity of college level personnel have had an appalling sameness, have shown few of the directions the schools are taking, have demonstrated graphically the tendency to ride hobbies, have shown gaps in understanding particular procedures, have shown a lack of quality thought in the assessment of research and research findings, or have reflected little of these research findings, lagging years behind the approaches that have been adumbrated by research.

To a large extent, the materials which have proved useful to the teacher, as well the procedures for dealing with the reading problems of individuals in the classroom, have been products of the field rather than having been generated in the colleges and universities. We, it would appear, have had to keep an eye on what is being done in the schools and reflect this in our teaching, rather than the reverse as might be expected.

Too little attention to the procedures of practical value in the classroom has resulted in the expansion of in-service education for which, in some cities, course-credit equivalency is granted. This procedure suggests that the colleges and universities may be diminishing in importance as the basic source for education. A too clinical approach to the training of reading specialists, has resulted in wide-spread feeling of inadequacy in this group on taking over that role in a school system. The comment that "I wasn't taught anything that I could use on the job" is the rule not the exception. On the other hand, the absence of psychological background has handicapped others.

The field of reading, like Topsy, just "growed." If attention to the solution of its professional problems is not given by the members of the profession, if we do not criticize ourselves, we can continue to look forward to lay criticism, and we will justly deserve it.

MEDICAL ASPECTS OF WRITTEN LANGUAGE DISABILITY

James J. Smith, M. D.
New York City

During the past 15 years I have studied somewhat more than 300 children of at least normal intelligence, who have the problem of written language disability. A few children brought to me for study were unable to use written language because of defective intelligence. They are not included in my observations.

Although a few of the students brought to me for help are girls, the majority are boys. For this reason, I shall describe the typical problem as occurring in a boy. This boy has a bright, alert manner. In oral communication he expresses himself well and clearly. He uses appropriately words he can neither recognize on the printed page, nor spell correctly. Curiously enough, this boy may fail to spell eight words out of ten correctly, and yet copy hundreds of words without a flaw. Indeed, many people attempt to help this child out of his spelling defect by teaching him to type. Unfortunately, he types copy perfectly, but is unable to type dictation with any facility at all. His problem is the specific difficulty of reading and comprehending written language, both as it appears on the printed page, and as he attempts to use it in spelling and composition.

His problem is not lack of intelligence. For in an intelligence test, such as the Bellevue-Wechsler, from which the manipulation of written language is deleted, he is found to score at least in the average zone. Many students with written language disability score in the bright normal and superior zones. However, if the intelligence test given depends on the utilization of written language, our problem student is actually being tested in terms of his own defect, his ability to use written language, instead of in terms of his basic intelligence. It is just as illogical to test his intelligence in this distorted fashion as it is to define a word in terms of itself.

If our student does not have a defect in intelligence, what, then, is his problem? It appears to be a developmental lag in adaptation.

Only 3,000 years ago, the Phoenicians made a complete break with the pictographic languages of the past. They devised an alphabet by which sounds could be written in abstract symbols. This was a development in intellectual evolution to which the nervous system of about 90% of the population was adapted. However, one person in ten, despite good intelligence, has been born with the initial inability to use the Phoenician advance in written language representation.

Why?

Although a picture tells its story irrespective of sidedness, abstract alphabetized language tells its story by progressing in only one direction. The direction can be either from left to right, or right to left. But it cannot be both simultaneously. This requires that one cerebral hemisphere be dominant for written language function.

The cerebral hemispheres may be thought of as screens upon which the abstract symbols of a written language such as ours are pro-

jected. However, the cerebral hemispheres (screens) present mirror images of each other. For the reader of average intelligence the word "was" on the printed page is always projected on one cerebral hemisphere as "was" So he always reads "was", and never "saw". When he takes his pen in hand to give the playback of the word projected on one screen or cerebral hemisphere, he always writes "was", and not "saw".

But the individual less differentiated in the evolutionary sense uses both cerebral hemispheres alternately, in random fashion. His print-out may read either "was" or "saw". His written spell-out may be either "saw" or "was".

Although hemisphere dominance shows itself in the handedness of the individual, handedness is not the key to opening up our understanding of written language disability. One sidedness, or unilaterality, is the fundamental consideration. The left handed boy with the firm laterality of left eye and left foot dominance, is quite as facile in the use of written language as the right handed boy with right eye and right foot dominance.

The majority of students with the problem of written language disability show the developmental lag of mixed cerebral dominance. Hand and eye dominance are crossed. That is, dominance of the left hand is combined with dominance of the right eye, or right hand dominance is found with dominance of the left eye.

Spoken language is circumambient to the listener, and does not show the component of sidedness. The unilateral direction of written language makes the student with the problem I describe do poorly either in a language written from left to right, English, or in a language written from right to left, Hebrew.

In thinking of this problem, it occurred to me that members of an ethnic group showing mixed cerebral dominance but using a pictographic, rather than an abstract symbolic, script might reveal the basic nature of our problem. A study of Chinese school children gave the answer. I found that the Chinese student with mixed cerebral dominance could both read and write his cultural language without difficulty. However, in English he showed the characteristic disability in written language.

And yet, the use of abstract symbols is not itself the problem. The problem exists when phonetic values must be rendered into symbols. The sound track must jibe with the print-out on the screen. If the print-out has no phonetic value, the student, despite his written language disability, can interpret the symbols correctly. Thus, a student with severe written language disability can read musical notation, which has no phonetic value, with ease. Therefore, difficulty of pattern recognition in written language is not the problem - remember the child who copies perfectly words that he cannot spell. The basic problem is the relationship between a unidirectional symbol pattern and its phonetic equivalent.

It is important to observe that some students with written language disability have only the reading problem, and that others have only a spelling problem. Many students have both problems. In gen-

eral, I should say that the student who spells well and reads poorly will make more rapid progress than the student who reads fairly well but spells poorly.

Often the student we are describing, who reads fluently enough as a vocal exercise, fails to comprehend what he is reading. I have had such students solve their learning problem by reading their texts into a tape recorder. They then learn their lessons perfectly by listening to the playback. Others will acquire knowledge and information by having someone read their textbooks to them. Indeed, the child with written language disability learns much of what he knows from pictures and by listening. It is for this reason that such students will often show a good knowledge of history and other subjects that are discussed and read aloud in class.

Much of our knowledge of the organization of the nervous system and the higher cerebral centers has been acquired only recently. Yet Shields, in his perceptive autobiography, THE MAKING AND THE UNMAKING OF A DULLARD, described accurately at the turn of the century the precise nature of the problem of written language disability. I cannot resist quoting the Dedication from this book, published in 1909.

> "To the Misunderstood Children Who are reached
> the stone of discouragement instead of the bread of
> hope and who are branded 'dull and backward' when
> laid upon the Procrustean bed of closely graded
> schools This Book is Dedicated in Loving Sympathy"

Although Gesell's modern work showed that the tonic neck reflexes were correlated with the ultimate sidedness of the child, true laterality differentiation is not present in the newborn. It begins to appear at about the age of 2½ years. At the age of about 6½ years approximately 90% of the population show decisive laterality. Thus, from infancy onward, one cerebral hemisphere slowly begins to develop the dominance that is basic to the ability to use abstract written language. The children, then, who fail to establish laterality are lagging in developing an aspect of evolutionary differentiation.

One must not overlook the fact that not all individuals with mixed cerebral dominance show the typical problem of written language disability. Conversely, one sees students with the spelling and reading problems who appear, on testing, to have unilateral dominance. However, these are exceptional cases. Mixed cerebral dominance is characteristic of most of the students showing written language disability. Some students, particularly girls, spontaneously outgrow this problem in their late teens or early twenties without abandoning their mixed dominance.

The nature of the suppression of one cerebral hemisphere, as it pertains to abstract written language, is not known. Suggestions of the mechanisms involved are beginning to appear in such work as that of Sperry and Di Chiro.

Sperry has shown that the corpus callosum serves as the pathway of communication between the two cerebral hemispheres. Indeed, by severing the corpus callosum completely, in both monkeys and cats.

Sperry has been able to produce animals that are literally two-brained. He teaches his animals to perform simultaneously acts that are contradictory to each other. That is, he can teach a split-brain monkey or cat to perform with his right limb an act that is both different from and contradictory to another act being performed by the left limb, at the same time.

In an electronic sense, it may be that the individual with written language disability has a "leak" from one cerebral hemisphere to the other through the corpus callosum.

Up to the work of DiChiro no one could demonstrate unequivocal gross or microscopic anatomical differences between the two cerebral hemispheres. He has shown, by contrast media angiographic studies, that the veins of Trolard and Labbe are more highly developed on the side of the dominant cerebral hemisphere.

What I have described, then, is the developmental lag in differentiation between the cerebral hemispheres. But this is not all that characterizes the student with the problem of written language disability. He usually shows distinct patterns of lag in other areas of biological growth and differentiation. Indeed, there is a certain unripeness to these children.

For example, hypogonadism is often found in boys with reading and spelling problems. Treatment of the hypogonadism often results in a startling improvement in written language facility.

Hypothyroidism is a common finding in the students I have described. Keeping in mind that it is thyroid hormone that makes it possible for the tadpole to grow and differentiate into a frog, one should not be surprised to find evidences of thyroid deficiency in the poor readers and spellers. Delayed bone maturation is almost always present in the children with this problem. Low basal metabolic rates often confirm the thyroid deficiency. More recently, my studies of the uptake of radioactive iodine by the thyroid glands of these students have often shown low values. The use of natural and synthetic thyroid substances in the treatment of these children usually results in distinct improvement in school work.

Skull X-rays often suggest the presence of deficient function of the pituitary gland. It is intriguing to speculate that appropriate amounts of human pituitary growth hormone might stimulate the lagging process of differentiation in our poor written language students. The anemia found in these pupils may, in fact, be a result of inadequate pituitary function.

My experience shows that the physician can make a basic and crucial contribution to the education of the child with the problem of written language disability. His role is to give the teacher a pupil physiologically able to manipulate written language. The physician does not teach the child. He readies the child for teaching.

The doctor can make his contribution in the following ways:

1. Recognize the problem and define it for parents, teachers, and child.

2. Make all persons involved realize that, despite the crucial role of medicine in this problem, the doctor is readying the child for good teaching: the teacher and student must take on from there.

3. Examine the child completely. The level of intelligence must be estimated by suitable tests. Cerebral dominance must be determined. Neurological, visual, and hearing defects must be identified and corrected.

4. Diagnostic procedures should include complete blood count, urinalysis, X-rays for bone age and endocrine status, thyroid function tests including radioactive studies, special chemical studies such as blood sugar, and hormone assays.

5. Treat the medical problems disclosed by the above studies. The most commonly found defects are anemia, hypothyroidism, hypogonadism, pituitary and adrenal dysfunction.

6. The newer synthetic substances (normal components of cerebral function) that improve and prolong attention span, promote neurological maturity, and reduce hyperexcitability, should be used.

7. Discontinue the use of sedatives, psychic energizers, and other artificial substances, so that the patient can respond to the positive action of the above program.

What can one expect from the program I have described?

One can hope to salvage and to restore to a normal school situation many of the students who have the problem of written language disability. A normal school environment gives incomparable social and psychological benefits to a previously lagging child. His acceptance by and identification with the group normal for his own age will form the basis of his entire adult relationships. Our program of 15 years' duration now produces a good crop of college graduates, among whom the occasional cum laude's and students with advanced degrees are particularly encouraging. Some of them, by becoming the parents of children with written language disability, have already made a distinct contribution by giving us new students in whom we can work out the genetics of the problem.

RESEARCH AND SECONDARY READING

Margaret J. Early
Teachers College
Columbia University

To represent research in secondary reading, I should like to describe briefly three studies that illustrate mainstreams in contemporary thinking. One of these is renewed emphasis upon the process of education: We want to know how the adolescent mind works in the process of reading. A second major concern is with methods of teaching in school settings as contrasted with experimental laboratories: What practices in teaching reading are supported by research studies? A third popular question has to do with the effects of reading: What does reading do to high school students?

Current interest in the process of reading can be illustrated by the massive investigation of Holmes and Singer, THE SUBSTRATA FACTOR THEORY: SUBSTRATA-FACTOR DIFFERENCES UNDERLYING READING ABILITY IN KNOWN GROUPS, (1) completed at a cost of a hundred thousand dollars under Carnegie and US Office grants.

The study examines a complex question: what combinations of abilities do groups of adolescents (boys-girls; good-poor; fast-slow readers) use in the reading act? It compares two complex statistical treatments and produces an array of data that I shouldn't try to simplify, because doing so makes the study appear at once more important and more trivial than it actually is. Justice can be done only by examining the whole study.

Briefly, Holmes and Singer did this: they gave the Van Wagenen-Dvorak Reading Test to 400 high school students who happened to be attending summer school at the University of California. Using z-scores, they identified the upper and lower 108 readers. The average of the lower group on speed, for example, was a Z score of 40, roughly equal to the 12th percentile; for the top group the score was 60, comparable to the 70th percentile. But the percentiles are on norms established by the total group itself, thus blurring the definition of "good" or "poor" reader.

Counting speed and power as the dependent variable, Holmes and Singer introduced 54 independent variables by obtaining scores on such factors as primary mental abilities, language abilities including vocabulary and range of information, verbal perception, listening comprehension, elements of musical ability (such as tonal memory, tone quality, rhythm, pitch), academic attitudes and habits, interests, emotional-social problems, musical appreciation, and chronological age. Both standardized and informal tests were used.

Many of the test items -- to judge only by samples given in the full report -- are ingenious, but others are of doubtful validity. The reader is left to guess at reasons for including tests of some abilities and omitting tests of others that may be equally pertinent. One wonders, for example, at the omission of tests of knowledge of syntactical structure.

Since what goes into a factor analysis largely determines what comes out, Holmes and Singer's findings verified their assumption that "excellence in reading is normally an audio-visual verbal-processing skill of symbolic reasoning, sustained by the interfacilitation of an intricate hierarchy of substrata factors which have been mobilized as a psychological working-system and pressed into service in accordance with the purpose of the reader."

Presumably this means that in order to read well the adolescent has to have a command of vocabulary, background information, and ability to comprehend spoken language (which also demands command of vocabulary and background information!) These basic abilities are, in turn, composed of skills that contribute varying amounts of weight to the reading process. Different known groups use these underlying skills in different degrees to accomplish their purposes in reading -- purposes in this case being either speed or power of comprehension.

Incidentally, Holmes and Singer report that, of the 54 variables, the least powerful factors in distinguishing between good and poor readers were personality, home adjustment, social adjustment and health.

The Holmes-Singer study is an important one, it seems to me, largely in its refinement of a statistical technique. Yet the problem they attacked is of utmost importance to us at the high school level where the main focus of teaching is improvement of speed and power of comprehension. Previous factor analyses of reading have resulted in similar findings -- that reading ability consists of probably three or four inter-related components. But Holmes and Singer went far beyond previous studies in the number of variables employed. Furthermore, they slanted the question differently. With them it was not so much a matter of locating components of speed and comprehension but of identifying the abilities that underlie these components and trying to find through statistical analysis how these abilities are "mobilized" by different kinds of readers -- their known groups. Nevertheless, their study rests on the measurements which produced the scores that were fed into the statistical analyses. Future studies may throw still more light on the reading process if use of the sub-strata factor analysis is preceded by probing the reading process by means of interview techniques, such as those suggested in Gray and Rogers' MATURITY IN READING (2), leading, hopefully, to more sensitive measurements of abilities.

The second current interest relates to teaching, and for this we turn to an example of applied research. Studies of teaching practices, says McCullough, generally prove that "we get what we work for consciously." (3) She notes that " if both students and teacher are aware of specific goals, those specific goals are more apt to be reached," but she warns that "narrowly conceived goals produce limited results."

A study reported in the February 1961 JOURNAL OF EDUCATION by Noall (4) heeds McCullough's warning, though the findings are limited by the fact that, as in most studies of this sort, the population is restricted by the energies of a single investigator. This type of applied research is an excellent argument for cooperative research in which measures and prodedures can be replicated in many situations.

Noall's study is reported under what may be an unfortunate title: AUTOMATIC TEACHING OF READING SKILLS IN HIGH SCHOOL. Later the author refers to the plan as "mass differentiated skills instruction" which also has unfortunate connotations. Both phrases refer to teaching a large number of students in the same room at the same time by use of multi-level materials which allow students to progress at their own rates individually, with provisions for small-group instruction as the need arises.

In Lynnfield, Massachusetts, 114 eleventh and twelfth grade students volunteered for the program which was offered after school for one hour, three times a week, for seven weeks, and was conducted in the school cafeteria. These students were good readers; their average IQ was 114, and their average pre-test scores on the Iowa Tests of Educational Development were at the 74th percentile. Average scores on the Spitzer Study Skills Test were approximately at the 60th percentile and on the Watson-Glaser Critical Thinking Appraisal at the 77th percentile.

Multi-level materials were provided to improve vocabulary, rate, organization and study skills, including interpretations of maps, charts and graphs. A trained but inexperienced teacher conducted the program. Mean scores on a second form of the standardized tests were significantly better at the conclusion of the experiment.

This study has hallmarks of good applied research. It was intelligently planned to test accepted principles of learning in a school situation. The number of students is sufficient to give significance to mean scores. The absence of a control group does not negate the findings, which illustrate that "we get what we consciously work for." One would hazard the guess that measurements on a control group would not have proved that "we get what we don't work for," especially because the control group, as the study was set up, would have differed on an essential factor -- motivation.

The report is of considerable practical value to classroom teachers because it describes in detail how to organize materials and prodedures for such a program. It is the first account I have seen of the actual execution of an idea similar, in some respects, to Diederich's Rutgers Plan. (5)

The third direction for research -- that is, to discover the impact of reading upon adolescents -- has had the least investigation. I should like to mention briefly one study - that of Loban, reported in LITERATURE AND SOCIAL SENSITIVITY, published by the National Council of Teachers of English in 1954. (6) From a sample of 376 high school students, Loban selected two groups of 60 each, representing the most sensitive and the least sensitive adolescents. These were chosen on the bases of classmates' and teachers' ratings and a standardized cruelty-compassion index. Each group was then studied intensively to learn as much as possible about the subjects as individuals. In the third phase of the study, students reacted to ten short stories. Among the tendencies revealed by their responses, the following are noteworthy: Adolescents tended to notice only the most obvious points; they expressed superficial concepts and were resistant to new values and ideas. While the most sensitive adolescents responded more fully, almost all students had difficulty in expressing honest or significant opinions. The essential finding was

that the ten stories, selected for their emotional impact, had negligible effects on both groups. It is worth noting, by the way, that the two groups were not distinguished by differences in intelligence.

The study is an important one because it enters new territory and blazes a trail for future studies of responses to reading. It was carefully designed and executed. And it serves an important function of research: to test long-standing assumptions. In this case, research raises havoc with our assumption that the reading of literature has measurable effects upon adolescents.

To summarize, then, we have noted outstanding examples in three channels of research activity. Our conclusions are obvious. Well-designed studies in secondary reading serve as patterns for further research and as guides for refining our assumptions. Like other tools in education, research depends for its usefulness on intelligent consumers and for its intrinsic worth upon the ideas that creative teachers generate.

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RESULTS OF EXPERIMENTATION ON THE WOOD READING TECHNIQUE

William Liddle
University of Delaware

For the past year and a half it has been my privilege to be engaged in a research project concerning one of the recent techniques in speed reading. It appears that certain statistically sound inferences may be drawn from the results of this study at this time.

It was hypothesized that by using the Dynamic Reading method, significant differences in rate of reading 3 to 10 times greater would be made by an experimental group over a control group. It was further hypothesized that significant differences in comprehension would be made by the experimental group over the control group.

Fifty students in their junior year at the University of Delaware served as the population. These students were divided by random selection into an experimental and a control group. Each subject was at or near stanine 7, 8, or 9 on the College Entrance Examination Boards, and each had a cumulative index of 2.0 or better. The subjects agreed to certain conditions. They were asked to attend two class meetings weekly of one and one-half hours each. They were asked to practice an hour daily, take all prescribed tests, and come for extra help if required. They agreed in advance to take the course at either of two 12 week periods, depending upon whether they were in the experimental or control group. None of these students had received previous training in rapid reading.

Four sets of tests were prepared for pre and post course measurement. The first was over approximately the first 8000 words of John Steinbeck's novel, THE PEARL. To avoid student familiarity with the non-fiction material the second test was over approximately 8000 words taken from PRINCIPLES OF SOCIOLOGY by Freedman and others. This text is not currently in use at the University of Delaware. For the purpose of pre testing on both fiction and non-fiction materials, both tests were administered to all subjects.

As a collateral part of this study, STEP test, form 1A, was given as a pre test to all subjects. The Strong Personality Inventory was given on a similar basis. Pictures were taken of all subjects while reading a selection on the Reading Eye Camera. The accompanying comprehension test was then administered.

The third and fourth tests were used in the post evaluation. The third test consisted of a test over the latter part of THE PEARL, (approximately 9000 words). The fourth test covered approximately a 9500 word article dealing with Folk, Rural, and Urban Communities taken from the sociology text previously mentioned.

These instruments were administered at the end of twelve weeks and 32 hours of instruction. The same instruments were administered to both the experimental and the control group. In addition, form 1B of the STEP test was given at this time. All subjects again read on the Reading Eye Camera and took the accompanying tests.

The number of items on tests one and three (fiction) totaled 64 and 65 respectively. The number of items on tests two and four (non-fiction) totaled 53 each.

The tests were so structured that the items tested information covered by approximately each 150 running words. In all cases the questions were of the multiple choice type. There were four items in the multiple choice from which a discrimination had to be made.

With the obtained scores the analysis of covariance was the statistical technique employed to test the significance of the differences between the groups. To use this technique it was necessary to adjust the final rate and comprehension for the initial rate and comprehension of both groups. The significance of the differences was tested at the 1% level of confidence and 5% level of confidence on the following sets of data for each group.

1. Fiction . . . . . pre and post test . . . . . rate
2. Fiction . . . . . pre and post test . . . . . comprehension
3. Non-fiction . . . pre and post test . . . . . rate
4. Non-fiction . . . pre and post test . . . . . comprehension

The data has been analyzed, but additional checking of the statistical work has not been made. Therefore, the following must necessarily be tentative.

The findings show that the mean rate of the experimental group is significantly greater than that of the control at the end of the experimental group's 32 hours of instruction. This is true in both the fiction and non-fiction materials used. There are no significant differences in the comprehension measured between the control and experimental group in the non-fiction test. This could be interpreted to mean that increasing speed apparently did not affect the comprehension of the experimental group in this situation. However, there was a significant negative difference made by the experimental group in comprehension on the fiction test.

It has been suggested that some current instruments may not provide enough material to test the maximum performance of students taught by this method. For this reason it was deemed advisable to use selections of greater length and develop instruments to test comprehension adequately. This investigator is admittedly not an authority in the field of test construction. Kuder-Richardson, formula 20, was employed to determine the statistical reliabilities of the experimenter made tests. These reliabilities are as follows:

Pre-fiction 66
Post fiction 69
Pre Non-fiction 51
Post Non-fiction 46

These values are the result of a single test administration. Though they are relatively low, they are adequate to predict significant differences in behavior.

One of the conditions for selection of subjects was requesting practice time of one hour per day. Students with an already full

schedule found this criterion difficult to meet. The program was based on a planned average of 80 hours practice per student. Instead of this the average was approximately 32 hours per student. This may have influenced the results of this study.

As an informal follow-up to this study the control group is currently receiving instruction in the Wood Reading technique. At the conclusion of this period of instruction the experimental group will be retested to gain a measure of skill retention.

TABLE I

This table includes the Mean and Standard Deviation of the Experimental Group.

	MEAN	STANDARD DEVIATION
Pre fiction rate	362.00	107.4393
Post fiction rate	2202.40	83.7674
Pre fiction comprehension	49.88 (78%)	5.4869
Post fiction comprehension	44.16 (68%)	4.0465
Pre non-fiction rate	250.72	46.1879
Post non-fiction rate	1398.80	49.3966
Pre non-fiction comprehension	41.52 (78%)	3.8275
Post non-fiction comprehension	37.00 (70%)	4.3081

TABLE II

This table includes the Mean and Standard Deviation of the Control Group.

	MEAN	STANDARD DEVIATION
Pre fiction rate	375.96	163.4901
Post fiction rate	413.80	176.9348
Pre fiction comprehension	48.72 (76%)	4.2569
Post fiction comprehension	53.00 (82%)	3.3106
Pre non-fiction rate	289.88	134.5705
Post non-fiction rate	274.80	91.7191
Pre non-fiction comprehension	41.48 (78%)	3.7107
Post non-fiction comprehension	37.92 (72%)	3.3932

READABILITY: CURRENT APPROACHES

Jeanne Chall
The City College, New York

Never before, in my nearly twenty years of studying this field, has there been so much activity. Yet at this very point of greatest activity in research and application of readability, there has set in the greatest reaction and criticism. Martin Mayer in The Schools, in his section on how secondary school textbooks are developed, notes:

> The authors are responsible for the content of the book and for the method of treatment, but not, generally speaking, for the actual writing, which will be done by the editors with the help of "readability" formulas. (These devices, typically, add the number of words in a sentence, multiply by syllables, punctuation marks, clauses, etc. and divide by an arbitrary constant to give an Arabic numeral which scientifically expresses "readability." . . .readability formulas make prose style impossible and nobody pays too much attention to how intelligently the material is organized. (13)

Mayer exaggerates the situation on the use of readability formulas in the writing of textbooks and he is certainly in error in his description of what the formulas measure. (They do not count punctuation marks and clauses.) However, although he exaggerates and makes some minor errors in description, he has put his finger on some of the serious limitations and pitfalls of readability formulas, long recognized by students in the field, and too often overlooked by many of the users: 1. That they are statistical devices that can give only a rough estimate of the difficulty of prose based on measuring limited aspects of reading difficulty (words, sentences, prepositional phrases, personal references, etc.). 2. That such formulas cannot be turned into rules for writing since they do not measure important aspects of comprehension difficulty such as organization, which he mentions, and other features which he does not mention—conceptual difficulties, format and illustrations, quality of the ideas, etc.

Students of readability measurement have ever been cognizant of the limited nature of readability formulas and have attempted through the years to find more reliable and valid means of predicting readability.

It is perhaps fitting here to define terms and to give a brief overview of past work in readability in order to give the necessary background for some of the current approaches to be described later.

Readability refers to characteristics of the printed material that affect how well it communicates in terms of comprehension, appeal, and legibility. Thus, subject matter, format, organization, as well as words and sentences are inherent in this broad definition of readability. During the past 40 years considerable research evidence has accumulated on those aspects of format and illustration that make for greater legibility and appeal. However, the greatest amount of attention has been paid to those aspects of style that affect comprehension difficulty. Since many of these aspects could be quantified and turned into readibility formulas (about 30 such formulas for

measuring difficulty were developed by the middle 1950's), and readability has become associated with readability formulas. An analogous situation exists in intelligence testing where broad definitions are used, but only limited aspects have been amenable to testing. Thus many psychologists are forced to define intelligence as that which intelligence tests measure. Similarly, many users of readability formulas fall back on defining readability as that which readability formulas measure. This is all right if at the same time one realizes that other aspects, not yet amenable to quantitative measurement, must be estimated and evaluated by judgment and experience.

In spite of the limitations of the readability formulas, however, studies have shown that readability scores agree quite well with teacher judgment of difficulty, with tested comprehension, and with pupil judgment of difficulty. There is also considerable agreement in readability scores, at least among the more widely used formulas (Lorge, Flesch, Dale-Chall, Farr-Jenkins-Paterson) (5). Thus, one can understand why they have been used so widely.

CURRENT APPROACHES

What has been the current activity in readability measurement? Have any new and better formulas been developed?

There have been several attempts to streamline the existing formulas and some attempts to develop "new" formulas. Powers (17) restandardized four adult readability formulas– Flesch, Dale-Chall, Farr-Jenkins-Paterson, and the Gunning Fog Index– by using a later version of the McCall-Crabbs Standard Test Lessons. He did not succeed, as he had hoped, in raising the predictions of difficulty, although the restandardization resulted in greater agreement among the four formulas.

Smith (18) reported a new two-factor formula, the Devereux Readability Index. The first factor is the number of characters per word (instead of the hard words of Lorge, unfamiliar words of Dale-Chall, and number of syllables of Flesch). The second factor is average sentence length, also used by the other major formulas. He reported a multiple correlation of .74 of these two factors with the grade levels of basal readers, and concluded that his formula was a valid substitute for the others since their multiple correlations were substantially the same. Unfortunately, Smith did not consider the fact that the basal readers are themselves graded on the basis of readability formulas. Thus, he succeeded in demonstrating that his new formula correlates with the others, not necessarily as well with tested comprehension difficulty.

Richard Bloomer (4) presented a readability formula based on the use of modifiers (adjectives and adverbs) and the structural composition of words. He, too, did not demonstrate that these factors were significantly superior to the already existing ones used in the older formulas, although he did demonstrate that they have a positive correlation with difficulty. Whether his new factors add substantially to a formula when the more traditional factors are used (some measure of vocabulary difficulty and sentence length) is yet to be demonstrated.

STUDIES ATTEMPTING TO MEASURE BROADER ASPECTS OF READABILITY

Several studies have broken through the confines of readability formulas and have attempted to get at the more subtle aspects of readability. These will be presented in some detail since I believe they will ultimately contribute significantly to our understanding of readability and ultimately to measurement.

The first is Taylor's Cloze Procedure (20). Cloze Procedure, according to Taylor, "is a new psychological tool for measuring the effectiveness of communication." Although at the outset, it was looked on as a new approach to readability, it has many other applications.

At the heart of the procedure is the "cloze" which is derived from Gestalt psychology's closure—the human tendency to complete a familiar, but incomplete pattern. For language, it would mean filling in missing words. Given chickens cackle and quack, almost anyone who is familiar with the language and our culture will supply "ducks."

As a measure of readability, Taylor omits words (by a predetermined pattern, let us say, every eighth word in a passage) and asks readers to fill in the gaps. He finds that passages on which the readers show good agreement on what the missing words are, are easier than those on which their is less agreement. For most selections, there is a high correlation among the Flesch, Dale-Chall, and Cloze scores. However, for selections taken from Gertrude Stein, James Joyce, and Erskine Caldwell, Cloze Procedure gives truer estimates of difficulty when compared with intuitive judgment. These selections "fooled" the formulas since they contained either short, but uncommon words (thus fooling the Flesch formula) or easy words used in a rare sense (thus fooling the Dale-Chall).

It should be noted that Taylor's Cloze Procedure is not a readability formula in the same sense as the others since it requires a panel of readers. Also, it does not yield an estimate of grade level difficulty, but only an estimate of relative difficulty. However, it can be a useful means of testing comprehension and will no doubt prove a simple means of checking the results of readability formula scores. But probably of greater importance will be its value in the constant pursuit of the more elusive aspects of readability that defy existing formulas.

Another promising departure on the effect of improved organization was presented by Eleanor Peterson (16). She showed the influence of improved organization and appeal on the comprehension of 10th grade students. Selections from a world history textbook were modified by reorganizing them so that the relationships of parts to wholes were more evident, by frequent summarization of concepts, and by defining major concepts when first presented. However, the Lorge Readability Indices for the original and modified versions remained the same.

Tenth grade students who read the modified passages had significantly higher comprehension scores, and introspective reports indicated that they enjoyed them better than the originals. Other inter-

esting findings were that objective questions tapping recall of specific detail were least affected by the improved organization. However, objective questions tapping inferences did show improvement. The tests that showed even greater value for the modified versions were those based on free responses.

Probably the most significant study in the measurement of organization are reported by Lorge at the Invitational Conference on Testing Problems of the Educational Testing Service in 1960 (11). This was his last contribution to the field before his untimely death in January, 1961. For the field of readability, however, it will probably mark the beginning of much fruitful effort by others, as did his earlier work on the Lorge formula that set the pattern for the other major formulas in use today.

Lorge attempted to find an objective means of measuring prose organization. A factor analysis of the ratings for mechanics, style, organization, reasoning and content of compositions written by candidates on the College Entrance Achievement Test disclosed that readers tended to rate papers either high, middle, or low on all these characteristics. They could not evaluate organization independently of a general halo effect of goodness.

After a study of various definitions of organization and coherence, Lorge hit on an operational means of demonstrating unity of prose. He selected passages that intuitively were judged to have good to poor organization. He cut these selections up as follows: by separating the paragraphs and by separating the sentences. He asked a group of college freshmen to rearrange the selections in the best order possible. An analysis of the various rearrangements disclosed that passages on which the students as a group had the greatest success (whether by paragraphs or by sentences) compared with the original arrangement, were those which had been intuitively judged to have better organization. Also, those selections on which there was the greatest consensus among the students, although not necessarily in agreement with the original arrangement, proved to have the best organization.

This method of measuring prose organization and coherence by having a panel of readers rearrange selections was offered by Lorge as an addition to expert judgment.

The effect of format organization (headings, subheads etc.) on speed of reading, acceptability, and immediate retention of technical material was studied by Klare and others (10). Passages that were similar except for high, middle, or low format organization, were read by naval trainees. No significant differences were found for speed of reading. However, significant differences in acceptability were found, with greatest preference for the selections with high format organization. Higher retention scores were found for high format organization, although only for the more able students were the differences significant. Could it be that poorer readers do not make use of the topic headings and hence no significant differences were found in their retention?

APPLICATIONS OF READABILITY MEASUREMENT

Applications of readability have been so wide that it is impossible in the space allotted to even list representative studies that have

been published. Formulas have recently been applied to textbooks in history, law, science, mathematics, psychology, biology, agriculture, to readers in psychology, to patents, intelligence tests, comic books, and classics, to best sellers, presidential addresses, and even to textbooks for teachers on the teaching of reading. (1, 2, 3, 6, 7, 9, 12, 14, 15, 19)

The full extent of application cannot really be estimated since publishers who use formulas as practical tools in their editorial decisions and authors who use them as checks on their writing seldom report this in the literature. However, an increasing number of advertising brochures and catalogues list readability scores and the formulas from which they are derived. Most of the multi-level reading kits use formulas to establish the reading levels of the selections. Workbooks for developmental reading at the high school and college level also grade their selections by readability formulas; some even give the formula and the specific readability score.

Much of this practical use of formulas is done with little cross checking by testing the material on students of known reading ability. Too often, the formula scores are accepted as true estimates of difficulty. Occasionally, consultants are called in for their expert judgment on the more elusive aspects of difficulty and total readability, but unfortunately this is not done as often as it should be.

In general, most of the published reports of applications of readability involve testing the material with a readability formula and comparing the resulting scores with the reading ability of groups for whom the materials are intended. Occasionally some selections are tested on samples of readers. Generally, however, they are not, and the formula grade level, as in the practical uses, is accepted as the true measure of the reading level of the book.

CONCLUDING REMARKS

Ernest Horn, in 1937, in commenting upon the use of the then prevailing method of measuring and controlling readability—vocabulary lists— wrote:

> There is a real danger that the mechanical and uncritical use of data on vocabulary will not only affect adversely the production, selection, and use of books but will also result in absurdities that will throw research in this field into disrepute. (8)

His observations still hold today. If Mayer's comments on the use of readability formulas are not to become reality, readability formulas will have to be used more critically, wisely, and with a "lighter hand." Although good beginnings have recently been made in the measurement of the more elusive aspects of readability, these have not yet been incorporated in the formulas, and must still be estimated by judgment and experience.

Another point which is too often overlooked in using formulas is that while they give some evidence of how difficult materials are, they do not tell the writer, editor, researcher or teacher, how hard they should be. This is especially important in selecting stories for anthologies and in selecting textbooks and supplementary materials for particular grades. If our goal is to teach literature, for example, selections should be made on the basis of literary criteria, and not on wheth-

er they have good readability scores. The selections must be worthwhile in themselves, whether easy or hard for the intended readers. The readability formulas can help point out which are probably easy or hard. If hard, then the teacher is alerted to teach more.

Another point that needs critical attention is that grade level estimates from readability formulas are time bound and therefore subject to change. While the relative measures will hold, the grade level scores may not. The readability formulas and the resulting grade level estimates were established by testing students who lived at a particular time– during the 1930's and 1940's. Should education and reading instruction improve significantly, and it looks as though they will, a book that was judged suitable for the average college freshman in 1940, may now be more suitable for an average high school senior and perhaps in 1970, may be within the ability of the average high school junior. If we accept present grade scores as fixed, we may be in danger of offering too little challenge to students, especially to the more able.

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A READING PROGRAM AT THE SECONDARY LEVEL

Edward J. Gallagher
Bay Shore Junior High School

OVERVIEW

Bay Shore, a residential community about forty-five miles east of New York City on Long Island's south shore, provides both a developmental and corrective reading program at the secondary level. At present the community maintains a junior high school composed of grades six through eight and a senior high school servicing grades nine through twelve. The secondary school population of 2,059 students (7-12) is handled by two and a half full time reading specialists in grades seven and eight and one full time specialist in the senior high school. All children at the junior high school level receive at least ten full weeks of reading instruction in both the seventh and eighth grades. Many students at this level also receive additional help on an individual or small group basis for varying time lengths. In the senior high school a corrective or developmental course of a semester's length is provided for ninth and/or eleventh and twelfth graders on an elective or selective basis. Each student receives a numerical grade at the finish of each course and one-half credit in English is earned by successful participation in one of the senior high reading courses.

The foundation for the secondary developmental-corrective reading program is laid at the elementary level where each school is staffed with a trained reading specialist. In addition to working with retarded readers, the building reading consultants assist classroom teachers, supervisors, counsellors and administrators and conduct workshops in the language arts areas. Administering and evaluating a variety of tests, maintaining permanent reading and progress reports, demonstrating the development of reading techniques in the content areas, and interpreting the reading program to the staff and the public are among the many responsibilities of these teachers. This pattern is continued at the junior high school level where a reading teacher supervises the reading program in the sixth grades in addition to participating in the secondary program.

Careful grouping is an essential feature of the reading program at all levels in Bay Shore. Data accumulated from formal and informal tests, from teacher evaluations and from school records are used for organizing pupils into four homogeneous instructional groups - accelerated, honors, regents and school. The responsibility for developing effective reading and study skills is accepted as part of the teaching job in every content area. The subject matter instructor teaches the skills requisite in his area in a natural, language arts setting. Skills in listening, speaking, reading, and writing are developed in virtually every activity which takes place in the course of the school day. Both rapid and slow learners are accommodated in this program.

The reading program at the secondary level is all inclusive, involving the total school staff and student body. Teachers, administrators, guidance personnel, and special services all have vital roles in carrying out the program. The core of the program is centered in each classroom. It is not restricted to the English class or to the

reading class, but is expanded to all areas of the school curriculum. In addition to providing for the retarded reader, provision is also made for correcting and developing the reading skills of the average and superior readers.

TESTING

Extensive and varied diagnostic and evaluative tools are used throughout the district. Each child progressing through the Bay Shore systems receives a minimum of three paper and pencil tests of basic intelligence (California Test of Mental Maturity, Otis, Differential Aptitude Test). Children recommended by the staff and those contemplated for the enriched classes are administered individual intelligence test (Stanford Binet, WISC or WAIS). Batteries of tests such as the California Reading Test and Iowa Test of Basic Skills are scheduled at different intervals throughout the system. Periodic visits to the school nurse, doctor, dental hygienist, opthalmologist, and speech therapist are arranged for all students for visual, hearing, and general physical screening. An adequate appraisal of the pupil's emotional status is provided on request by one of the district's three psychologists, the consulting psychiatrist or by the Bay Shore Child Guidance Clinic. These test results, plus teacher appraisals, confidential reports and other pertinent data, are carefully and efficiently maintained in an orderly arranged cumulative folder. This information is housed in the guidance wing of the particular school where it is conveniently accessible to all staff members. Counsellors, teachers, and other special service personnel avail themselves of this information regularly while working with the students.

In many academic classes and especially in the reading classes use is made of formal and informal tests; they are used to determine strengths and weaknesses at the beginning of the course and to measure growth by comparing "pre" and "post" test performances at the conclusion. Among the different tests used in the secondary reading program are: the Gates Advanced Primary, Gates Reading Survey, California, Triggs Diagnostic Test, Cooperative Reading Test (Levels C1 and C2) and a variety of informal tests of reading, spelling, word recognition, and vocabulary and survey tests of basic reading skills. The availability of such a variety of testing devices is to insure adequate evaluation of each individual's abilities and to measure more accurately his progress in specific reading skills. Instead of using one test for all the students of a given grade where clusters of scores will be found at the extremes, tests more in line with the student's expected functioning level are used. For instance, in the eighth grade some of the students might take a Gates Primary Reading Test while the more advanced ones in the grade would be tested on a Cooperative Reading Test. This differentiated testing approach enables the staff to ascertain more effectively just where the student is and to proceed more systematically with his instructional program.

SCHEDULING

To complement the developmental and corrective reading program in the academic classes, small groups are formed to receive intensive instruction in specific language skills. A ten weeks period of each seventh and eighth grade student's schedule is blocked for specific reading instruction. This is accomplished by scheduling the

students for twenty weeks of industrial or home arts and by dividing the remaining twenty weeks of the forty week school year between art and reading. Scheduling in this manner affords an opportunity for all students, those who are achieving as well as those who are retarded, to receive reading instruction on a daily basis without any undesirable stigma or label being attached. Each of the homogeneous academic classes, which run from twenty to thirty students, is sub-divided into two reading groups of fromten to fifteen students. The subgrouping usually follows a scrutiny of the cumulative records and consultations between the reading specialists and special service people to obtain the most advantageous placement of each student. In addition to carrying his regular load of five teaching periods, the reading teacher handles the more severely retarded readers or those pupils requiring extra help twice a week during activity period. In the senior high school a corrective reading course is offered for freshmen, juniors and seniors, and a more advanced developmental course is proffered for the college-orientated eleventh and twelfth graders.

THE READING CLASSES

In the supplementary reading courses no attempt is made to treat reading in isolation containing a subject matter of its own. Instead of attempting to teach the students to read "reading", the stress is placed upon developing the student's ability to deal more successfully with his reading of history, science or literature. Reading is approached as a process dependent upon and related to listening, speaking and writing abilities. Learnings necessary for proficiency in reading are taught in practical situations, during listening activities, in exercises emphasizing oral or written expression, as well as during the "reading lesson." Reading materials similar to those employed in the content areas are utilized and skills needed to deal successfully with these readings are accentuated.

At the secondary level in the regular classroom and in the supplementary reading course - corrective or developmental - the directed reading activity is the core of the program. Exploration and development of requisite background for the immediate task; guided silent reading: evaluation of conceptual development and thinking skills presented through the material; silent and/or oral rereading for any number of purposes, such as to refute or substantiate an opinion and follow-up activities to review or cement learnings, are all essential features of the "reading lesson." The directed reading activity is complemented in the reading course by intensive practice in specific reading skills governed by the levels of the group and the experience of the instructor. Some of the skills emphasized in the junior high reading classes include the following: knowledge of syllabication and vowel principles, word analysis techniques, spelling, establishing purposes for reading, vocabulary development, proper study procedures, paragraph organization, recognition of signal words, SQ3R, simple and complex outlining, notetaking, improving rate, varying rate to fit purpose, appreciating poetry, handling propaganda, dealing with verbal analogies, and writing paragraphs, reports, and summaries. In the senior high corrective courses, these skills are continually developed, refined and extended. In the developmental course for the college-bound students the accent is on the critical analysis and interpretation of an extensive amount of good and bad fiction to enable the student to benefit more profitably from future reading.

MATERIALS

Varied reading materials, at all levels, for independent and instructional reading purposes abound throughout all curriculum areas ensuring differentiated instruction. Textbooks, classroom libraries, teacher-prepared exercises, workbooks and other printed materials form the base of the program in the reading courses. The materials range in difficulty from primary to college level and include most of the popular items by the various publishing houses. Films, kits, tapes, records, and other mechanical devices are available to both subject-matter teachers and reading teachers. However, these instruments are viewed as accessories and are used with caution and discretion.

PHILOSOPHY

At Bay Shore reading is treated as a thinking process stimulated by written language. Because this process is used in all life experiences in which visual language symbols are involved, the place of reading in the secondary level program cannot be considered separate from other facets of language or limited to any one particular area. Reading in Bay Shore is considered a developmental process demanding a systematic program of instruction beyond the elementary level in all curriculum fields.

A JUNIOR COLLEGE READING PROGRAM

Paul E. Nagy
Baltimore Public Schools

THE JUNIOR COLLEGE

A governor's commission, whose purpose was to study the needs of higher education in Maryland, recommended the immediate establishment of community colleges. As a result, in 1957 four community colleges were founded throughout the state; Essex Community College was one of these. Essex Community College offers the following programs: Liberal Arts, Pre-Teacher Education, Pre-Engineering, Business Administration, and a terminal program in Business and Industrial Supervision.

ENTRANCE EXAMINATIONS

All students, upon entering the college, are given the SCAT (School and College Ability Test), which measures developed ability in the basic skills and indicates the relative academic success which the student is likely to achieve. Students are also given the STEP (Sequential Test of Educational Progress), which attempts to measure academic achievement; the tests focusing on skills in solving new problems on the basis of information learned rather than on the ability to handle only lesson material.

If the student scores below the 40th percentile on either the reading or verbal segments of the tests, he is assigned to English 10, a non-credit course which has a title of "Reading Skills" and is equivalent to a 3-hour course. At present, only those below the 40th percentile take this course, and it is mandatory that they successfully complete the course before they are admitted into a regular program.

Individuals exhibiting this particular test pattern are chosen because records from previous years indicate an extremely high level of failure in those subjects entailing the language arts; therefore, this reading course was initiated to improve the student's opportunities for success.

There is another course, English 9, "Review of English," which may also be required, either alone or in conjunction with English 10, before the student may proceed into a regular curriculum.

READING STUDENTS

Because of its location in a large, heavily-populated, suburban area adjacent to Baltimore, a differentiated group of students attends Essex Community College. The student population encompasses individuals who are freshly graduated from high school as well as mature adults who have long been separated from any association with schooling. Class size normally ranges from 10 to 15 students, and the number of class sections per semester varies, depending on the number of new students enrolling at the college and their test results.

COURSE OUTLINE

The Reading Skills course consists of four basic areas: (1) Spelling, (2) Study Skills, (3) Vocabulary, and (4) Reading. However, at the beginning, several periods are spent in either further testing or

general orientation as to the purpose and objectives of the course, and developing an awareness of the relative importance of the language arts.

Other than the Nelson-Denny, further standardized tests are not used. Materials are developed and mimeographed explicitly to strengthen the skills of the students in areas where a need is indicated, and are varied with student requirements.

(1) Spelling.

Spelling is approached on an individual basis. The students are tested at the beginning of the course, and from the results of this test individual spelling programs are designed. Each student is responsible for carrying out his particular program. Programs are assigned in this manner because there is such a tremendous divergence of spelling achievement in each class that it is difficult to find some common basis which is beneficial to the whole group.

(2) Study Skills

Study skills are covered with the purpose in mind of giving the student the mechanical means and skills which will assist him in performing at a higher level of competency.

a. Organization of a Textbook: This subject is discussed and the students are made aware of how this knowledge can help them in studying their various subjects.

b. Lecture Notes: The mechanical advantages of certain procedures are taught; then several lectures are given, some of which have been highly organized, others which superficially do not appear to be organized. An evaluation is then made of each student's notes by personal inspection and various methods of testing to determine whether the notes are meaningful.

c. SQ3R (Survey-Question-Read-Recite-Review) This study device is usable in most situations which a student encounters. Exercises in the appropriate use of this device are given to facilitate the student's mastery and control of it.

d. Preparation for Examinations: Discussions are held regarding the timing of reviews and kind of reviews. Students are reminded that frequent, short periods of review are more effective than prolonged ones.

e. Writing Examinations: Both objective and subjective examinations are discussed. Various types of questions that might be encountered on the objective test are introduced to the students, and they are taught the fundamentals of writing essay examinations.

f. Various tests are administered throughout the course, and they are used as an evaluation of the student's application of the skills taught.

(3) Vocabulary

Here the history of the English language is discussed in order to create an awareness of the many words in our language which are "borrowed". Pronunciation aids are taught, with special emphasis on foreign words. In conjunction with the finding that the students in this course usually have a persistent vagueness in their dealings with words, preciseness of meaning is stressed.

a. Denotation.

b. Connotation. Students learn that meanings are a product of experience and that connotations cannot be mastered simply by looking in the dictionary.

c. Lists of words are prepared which are pertinent to the subjects to be studied by the students in their regular program.

d. Affixes.

e. During study of their regular subject matter, students must develop the habit of looking up words with which they are not familiar.

f. An awareness is created in the student of the variances in meanings of words; how words may have meanings ranging from concrete to abstract; from a simple to a high level of conceptualization.

g. Sprint periods. During these periods the class consciously uses in conversation as many newly-learned words as possible.

(4) Reading

SRA materials are utilized, including power builders, rate builders, and reading-for-understanding cards. Further, the controlled reader is used; with this device the mechanics of eye movements are indicated and their relationship to good reading. Some of the items discussed are fixations, length of sweep, necessity of a swift return sweep to the next line, regressions, and the elimination of immature reading habits such as lip movement, finger pointing, or inward articulation.

Most students show a reading speed of less than 200 words per minute when entering the course. The controlled reader and rate builders are used in the classroom to facilitate the development of speed in their readings to a more satisfactory level, recognizing, of course, the three basic types of reading: 1. skimming, 2. rapid, and 3. study . Various materials are used to develop an understanding of the three types of reading and their proper usage. Some exercises, for example, have been developed solely to increase the student's ability to use skimming skills at a speed of several pages per minute. Some of the mimeographed materials which have had recurring value revolve around such things as:

1. Reading literature.
   a. Context clues to discover setting.
   b. Characters, traits and emotions.
2. Reading newspapers, magazines, and textbooks.
3. Recognizing authority.
4. Judgment of bias, reliability.
5. Ability to distinguish between fact and opinion.

Throughout all of these various reading skills, emphasis is placed on the development of good basic thinking habits, especially on an abstract and conceptual level.

CONCLUSION

While the four areas of spelling, study skills, vocabulary, and reading are discussed separately here, in the actual classroom situation they are interwoven according to the needs of each class.

It has been our experience that these are the areas which should be covered; their depth and breadth dependent upon the student group and their particular needs.

It has been a finding of the college, on tests given at the end of the student's stay at the institution, that while they made progress in all areas, the greatest progress was experienced in the area of reading.

EMPHASIZING STUDY SKILLS

Walter Pauk
Cornell University

I should like to share with you some of the organizational and instructional ideas and methods which we have been using at Cornell lately; and to report, in descriptive terms on how these ideas and methods are working out.

First, permit me to explain the administrative set-up of the program itself. The Reading-Study Center is autonomous; that is, we are not controlled by, nor accountable to any department or school; consequently, in addition to other advantages, we are completely free to experiment.

To set the stage for the new approach which we are now using, let me take you back for a quick look at the beginning. Like most college reading programs we started out to teach speed reading, comprehension techniques, some vocabulary, and some study skills. We had mechanical devices, too: the tachistoscope, speeded reading films, and the reading accelerator. To accomodate about 200 students each semester, we offered 10 sections which met twice a week for lectures, and once a week for laboratory practice. Enrollment in this non-credit course was voluntary, and it ran for a full semester. The two drawbacks of this program were obvious: first, it was too long for a non-credit course; and second, it served less than four per cent of the registered students.

Over a period of time, we overcame the drawback of course length mainly by having students read the longer practice exercises outside of class; but we were unable to make room for more students. Almost every Fall semester we would get over 1200 applications: we accepted only 200. More important than reducing the length of the course, we introduced more and more realistic study skills.

In addition to our reading courses, we always carried on conferences and counseling sessions with individual students who came seeking help. In most instances, these individuals were in dire academic difficulty. Almost without exception, in these counseling situations, we resorted to giving the student two or three study techniques which we believed were essential to academic success. We never attempted to teach any speed reading. In following up these counseling cases, in which only study skills were taught, the high rate of success often made us pause to ask ourselves whether we were wasting our time, and the students' time as well, with speeded films, tachistoscopes, reading accelerators, and workbooks.

At this point let me break with the past and report on what we did this year. Both the president of the university and the vice president for student affairs were eager to lift, to an even higher plane, the academic excellence at the university. The total faculty was involved, but my specific task was to provide to as many students as possible the tools to make study and learning more effective.

Let me first give you the results, in numbers at least, of what the Reading-Study Program accomplished without any increase in personnel. Remember, in the old program, we were able to take only 400

students in an academic year, whereas, in the new program, over 4000 students were given what we term as the essential skills for academic success. These essential skills will be explained as we progress.

Having had advance notice of the president's desires, we had time to plan, publicize, and put into effect the new program consisting of three types of courses, rather than the usual one course. The three new courses were as follows: first, we offered a fourteen-session reading and study skills course. Second, we offered a ten-session speed reading course. Third, we offered a six-session study skills course, shorn of any speed reading.

By offering three different courses for these relatively brief times, we gained the following advantages:

1. students were able to enroll in a course in which they were most interested;
2. since the overall time involved was short, our holding power was almost perfect. Since some of our students would bring along their roommates, we frequently ended having more than our initial enrollment;
3. we were able to run several of these programs each semester.

Another incidental but important finding was this. Our experimental programs helped to clarify the question about class size. Some studies report that 17 to 20 is the best class size for teaching reading. However, we found that by using proper materials, we could work effectively with about 35 students. More interesting to us, however, was that in classes devoted entirely to study skills, we found that we could work effectively with larger groups. We experimented and found that we could work with groups up to 200 students.

In addition to our new offerings of three types of courses, we departed even more radically from the traditional way of operating the program by offering our services to on-going orientation courses for freshmen; that is, most colleges and schools at Cornell carry on special orientation courses, meeting once a week throughout the entire semester. Here, in sections ranging from 100 to 200 students, we presented the essential study skills in a four-hour course. This venture proved so successful that several additional schools at Cornell have already arranged to have a similar study skills course presented to their entire freshmen classes next fall.

While we are on the subject of teaching study skills to large groups, I should like to digress to issue a warning. We have been asked to present these essential study skills to the entire incoming freshman class during the general orientation week. This would consist of groups numbering about 500. We have always refused. We feel that the students are still in a getting-acquainted mood, more interested in meeting fellow students and getting used to strange surroundings than in concentrating on academic matters. Furthermore, most of the freshmen, having been top students in high school, would probably feel that they were rather proficient in study skills anyway. It is better to receive such students into a course after a few weeks have gone by. By that time many realize that they do need help and come voluntarily.

The third way in which we departed from our original role was that we set up several classes to train student-instructors to teach study skills to small groups of students. This was confined entirely to fraternities. Let me explain how this came about. The fraternities at Cornell (54 of them) having decided to improve their academic standings, sought our help. Knowing that it would be physically impossible to deliver a series of talks to each fraternity, we suggested that each fraternity send to us one senior, a top student who also had the ability to talk to groups, and that we would train these students to teach study skills. This we did, and after the training sessions were over, we supplied each student-instructor with a packet of mimeographed material to be used in his talks. These student-instructors not only delivered the series of talks to the older membership in their respective houses, but, in separate sessions, to the new pledge-classes as well. More important, they soon became on-the-premises experts who were available not only for consultation, but to supervise the study techniques of the pledges by dropping into their rooms during study hours. Just to make one point clear: notice, we did not attempt to teach these student-instructors how to teach speed reading.

Thus, by offering three types of courses, by teaching large orientation classes, and by the use of student-instructors, a large number of students was reached. Some people might wonder about the effectiveness of these programs. These people have a right to wonder We recognize that the degree of effectiveness must be shown in objective terms. We have set up control groups, comparisons with previous classes, and studies within studies to extract as much as possible from our experiment. We will release these findings when the studies are complete. Since we have dealt with about 4000 students we already have had numerous individual reports of academic improvement. Some reports are quite startling. For instance, one junior in the engineering school reported a 15 grade-point average increase over his previous semester, even though he slighted two subjects because of fraternity pledging. He attributes the gain to the study skills learned. Of course, this is only one case, and the cases that one hears about are usually the successful ones. As I mentioned before, we are still gathering data.

In one of the above studies, we are comparing students who took the reading course with students who took only the study skills course. Based on our experience, we suspect that a reading course (without study skills) does not help the students very much academically. After all, it is difficult to see how speeding through stories about coyotes and Paul Bunyan can help them do a better job in Physics or zoology; or in literature where essays from Emerson, Carlyle, Thackeray, and Ruskin are assigned; or on novels by Camus or Conrad; or in the philosophy of Dewey or Liebnitz. As we look over the 742 courses given at Cornell, we do not see where speed reading could do much good; but, we do know that the study techniques can be applied to every one of these courses.

Perhaps, at this point, you are asking yourselves, "Well, what is it that they teach in their Essential Study Skills Course?" If I were given space for six hours of lecturing, I could duplicate the course for you; but, in this paper the best that I can do is to list the topics, and to provide brief examples. In the study skills course, the following topics are thoroughly explored:

1. Attitudes toward college work and study. We present ideas on how to become academically involved in studies; why it is good to be academically aggressive; and the inseparability of concentration and genuine involvement.

2. Scheduling. We say that it is wrong to make up weekly time schedules which attempt to account for every five-minute increment. We advance the "time-block" idea.

3. Listening and taking notes. Here we present the six principles for listening to a lecture; the five common misconceptions about lecture notes; the five common rationalizations for not taking notes; the twenty general suggestions to help take better notes; and the four specimen copies of notes on various subjects.

4. How to master the textbook. The OK4R system is used to help the students master the textbook -- not for passing examinations, but for really learning the material. The new "R" in the system is Reflection. Several days ago, while talking to Professor Hans Benthe about this concept of reflection, he said that a student can become quite proficient, but never creative if he depends solely upon memorizing data and ideas from lectures and textbooks. Mastery and creativity come when the student continually reflects upon facts and ideas, attempting to synthesize and place them into new situations and relationships. Lectures and textbooks can take the student to the frontiers of knowledge, but reflection can lift him to the exciting realm of new knowledge.

5. How to write a good examination. No gimmicks or tricks for passing examinations are included. The emphasis is on the analysis of the seven most common errors made by students on essay-type examinations, and how to overcome these errors.

6. How to write the research paper. We teach the students how to: delve deeply into a topic; find and select raw data; reflect, speculate, and meditate upon implications and relationships; glimpse and follow insights; establish logical categories; organize an outline; think and write with clarity and precision; and revise.

In summary and conclusion, may I say that as of the moment my own experience leads me to believe that a carefully designed study skills course comes closer to meeting the real academic needs of college students than courses in which speed reading is stressed.

I'm afraid that I look askance at the many programs which emphasize speed reading alone. These programs are armed with tachistoscopes and perceptoscopes, films and accelerators, workbooks and boxed snippets. Their research reports, based on speed tests given before and after, show doubling or tripling of speed. Comprehension increases, too. The right answers in multiple-choice questions often pop up like bread from a toaster. My question is: do such courses really help the student to do a better job academically?

How did the strong emphasis on fast reading come about anyway? It is possible that this emphasis on fast reading is based, to some degree, on a misinterpretation of statements frequently made by professors, deans, and college presidents. When a college dean says,

"The chief trouble with our students is that they cannot read," what he means by the word "read", as I take it, is not that the students cannot make "reading noises"; but that they really don't know how to study. To satisfy our dean a student should pause over the important ideas to find out exactly what the author is saying; then after determining the sense meaning, he should go on to see how the idea is supported; then the student should decide whether or not the idea, on the basis of evidence, is sound or unsound; then he should reflect on the idea to see how it fits into his own framework of knowledge. Having done this, the student is now prepared to do a scholarly job in class the next day. This procedure, as I see it, is a study skill -- this is the procedure used by a true scholar intent on mastering his work.

However, the opposite happens. People hear the dean's statement with the word "read" in it, and many run for the accelerator and films, saying, "We've got to teach our students how to read faster."

Perhaps we should tell our students that study is hard work, but that it can be pleasurable too; that is, if one gets pleasure out of mastering his work. Mastery, you see, is a beautiful word, and it means, for one thing, to be in control. Mastery of a topic, subject, or field means the ability to converse or write on a certain group of associated concepts -- perhaps unexpectedly. Mastery, I believe can be achieved through proper study skills.

WHEN SHOULD THE CLASSROOM TEACHER CONSIDER REFERRAL?

Dorothy E. Withrow
Philadelphia Public Schools

Referral to a reading clinic must be made within the limits set by the school district involved. Therefore, the following suggestions will be made within the setting of the Reading Clinic in the Philadelphia Public Schools. For the most part, the criteria for selection are general, but there are a few likely to be peculiar to individual districts. Hence, the latter must be adapted to fit each particular school situation.

The Philadelphia Reading Clinic offers four major services: diagnosis, instruction, teacher-training, and research. Referral for diagnosis may be made for any child from first through twelfth grade provided he meets the requirements. While most referrals come from the third through sixth grades, there are always some from the grades below and above these limits.

Referral is considered on the basis of three major criteria. First, the pupil should in some way show evidence of having average or better mental ability. This provision is set for two reasons. The schools are supposed to provide within their own curricular organization for the slow-learning child and through the Division of Special Education for the mentally retarded pupil. Also, limited Reading Clinic facilities and staff demand that attention be given first to those having a higher potential for successful rehabilitation within a shorter period of time. Therefore, it must be determined whether the child has a severe reading retardation or low mental ability or both.

The second major consideration involves serious retardation in reading. This means that if a child is reading only a year or two below his expectancy level, the school should endeavor to correct his deficiency through classroom grouping in reading instruction, or through periods set aside for special reading instruction with a teacher released to spend full or part time for this purpose. The only exception would be the first or second grade child who shows a retardation in reading of more than six months, failing to respond to instruction as well as he should in relation to his mental age. In Philadelphia there is at least one full-time remedial reading teacher appointed to every junior high school, senior high school, and vocational-technical high school. These teachers work with the corrective cases, for the most part. Those who have had clinical training also take remedial cases for individual instruction. In many elementary schools there are reading adjustment teachers, who work with small groups of retarded readers. Wherever possible, those with university or in-service training at the Reading Clinic also work individually with pupils who have had the Reading Clinic diagnoses.

If the child is of normal mental ability, is seriously retarded in reading, and has failed to respond to whatever reading instruction the school has been able to offer, then he should be referred to the Reading Clinic. When the classroom teacher or the reading teacher works with him and he responds to her instruction, then he is not a candidate for referral.

Diagnosis is a vital part of any school program and is a continuous process. It is necessary that all teachers be sufficiently familiar with the many possible symptoms of reading disability so as to be able to identify them in order to make proper clinic referral. Identification of the reading disability that should have clinical diagnosis is therefore an important aspect of every teacher's responsibility. Hence, she must learn to recognize the symptoms of reading retardation, especially since they are not always easy to detect and may betray themselves through behavior symptoms of great variety.

Children with reading problems exhibit several signs pointing to their disability. The most obvious one is that such a child is likely to be reading well below the level expected of his age and grade despite the fact that he is mentally normal. If the school has a regular testing program, or if the teacher administers standardized tests, the scores in achievement may be compared with the child's I. Q. or other scores indicating mental ability. If achievement is considerably lower than ability, it is very likely that a reading problem exists.

If the pupil's I. Q., as recorded by the school, is based on an individual psychological test, such as the Wechsler Intelligence Scale for Children (WISC), then the discrepancy between ability and achievement will be obvious, since the WISC does not depend upon reading. If the school must rely solely upon group intelligence tests that require the child to read the questions, then a low I.Q. may merely indicate reading disability rather than low intelligence. Consequently, other measures must be taken to distinguish between low mental ability and severe reading retardation. A group intelligence test given in first grade does not depend upon reading, as do the later ones. Therefore, if a child scores as average or better on the first grade test and then shows a decline in scores thereafter - either gradual or sudden - a reading problem may be suspected.

Another indication appears in the pupil's speaking vocabulary, which may be good as compared to his word recognition ability. Among those tested at the Reading Clinic during the current school year were thirty-one pupils from third grade through ninth. Of these, eighteen had an oral reading instructional level at primer or below. Only four out of the eighteen had an oral vocabulary I. Q. below 100 on the WISC. Of the remaining fourteen, nine obtained I. Q's on vocabulary ranging from 113 to 131, one fell at 106, and four at 100. These startling differences between oral vocabulary and word recognition support the suggestion that classroom teachers may discover reading problems by comparing a pupil's speaking vocabulary with his ability to read words.

The students themselves often give a hint of the difficulty in their very efforts to conceal it. They tend to emphasize oral work, avoiding writing whenever possible. They sometimes volunteer and do quite well in oral discussion in order to cover their reading deficiency. A comparison of pupils' oral and written work will therefore often yield a clue as to reading problems.

If the teacher is accustomed to giving an informal reading inventory, whereby she can discover the pupil's instructional reading level, she can compare this with his auditory comprehension ability.

If he can understand material read to him at or above his grade level, although he is reading more than two levels below that, then he is probably a person with a reading problem and with at least average mental ability. Characteristic of the children diagnosed at the Clinic is an eighth-grade boy whose instructional reading level is preprimer while his listening comprehension is at the tenth level. Another case is that of a third-grade boy with an auditory comprehension level at seventh, but with a primer instructional reading level. A third boy, now in eighth grade, is able to understand, when it is read to him, material designed for advanced high school seniors though he needs reading instruction at the third level. These are the people who can follow oral directions accurately although they would be unable to handle those same instructions in print.

It has been noted that many children with average or superior mental ability have high arithmetic achievement scores. When the teacher finds pupils having trouble with subjects involving reading but doing very well with numbers, she should investigate the possibility that this is a normal child with a reading disability rather than a mentally dull child doing as well as can be expected of him. Since the high arithmetic score is not invariably a sign of normal or superior mental ability, however, it should be used cautiously and only in conjunction with other signs that may point to a reading problem.

It is possible, through careful observation of the child and through conferences with his other teachers and his counselor, for the classroom teacher to discover if this pupil has a disability requiring referral to a reading clinic. An experienced teacher's judgment is very important in this respect and can be quite as valid as objective tests. While there are many tests available to the teacher to assist in diagnosing ability and achievement, the most effective diagnosis is often that which the teacher bases on her own observations of the pupil's ability, and of his skills and deficiencies in reading as compared with his intelligence. In past school records and in her personal observation of the pupil, the teacher can find several behavior symptoms that may lead her to explore the possibility of a reading problem.

The teacher may look in many directions for behavior signs pointing to a reading disability. If there is, for example, a history of school phobia, it is possible that a learning problem has developed. There may be labels attached to the child, such as lazy, irresponsible, apathetic, or insolent. He may assume an "I-don't-care," shrug-of-the-shoulder attitude, when in truth he cares very much. The teacher should note any nervous mannerisms, such as nail-biting, knuckle-cracking, squinting, frowning, twitching, blinking, constant foot or leg-wiggling. His habitual expression may serve as a guide-post, the teacher observing whether it is usually sad, anxious, tense, angry, or tired. His speech may be rapid or slow; he may be a compulsive talker or an uncommunicative person. His general attitude may be one of suspicion, hostility or over-dependence. The teacher may mark whether he is customarily cooperative or uncooperative, self-centered or considerate, patient or impatient, withdrawn or hyperactive, over-conforming or non-conforming. Any of these, in conjunction with poor achievement, might point to behavior patterns developed as a defense concealing his true feelings of inadequacy about his ability, or hiding his passive

resistance to learning, which he uses to manipulate or to punish the adults in his environment. The student who did not learn to read when his classmates did, will be subjected to a pyramiding of feelings of inadequacy and failure. Such feelings can become deeply rooted, affecting every area of the youth's existence. Consequently, these young people take refuge in apathy, indifference, or outright rebellion. The behavior that is annoying to the teacher, the lack of interest in or the inability to do the assigned work, all may be the result of conditions outside the child's ability to handle successfully, and so his school work suffers. Teachers at times pay lip service to the acknowledged fact that all behavior is caused, while in practice they tend to ignore it, and by their handling of the student aggravate, if they do not actually create, the conditions producing the very behavior they deplore.

Finally, the teacher may be alerted to a possible reading disability by taking note of the pupil's poor motor coordination, general awkwardness, difficulty in remembering symbols from one day to the next, or extreme hyperactivity as seen in the child who literally cannot sit still. Any of these or other signs suggesting neurological deficit or subtle, diffuse brain damage could be operative in a case of primary reading disability.

In summary, then, the following are the types of cases for which diagnosis should be requested:

1. Seriously retarded readers who are of normal intelligence so far as can be determined.

2. Seriously retarded readers who have failed to make progress after at least one term of special help in reading in school, when such help is available.

3. Seriously retarded readers who give evidence of emotional disturbance in relation to activities involving reading.

4. Seriously retarded readers who have entered from outside the school system with inadequate records of ability and achievement

In other words, the school should do everything possible within its own organization to help the pupil whose achievement in reading is well below his mental ability. If this succeeds, then the child does not need clinical referral. If he shows an apparent inability to respond to reading instruction, then he does need referral to a reading clinic.

Capable youth must not continue to suffer school failure because of reading disability. If all teachers were made acquainted with the symptoms of reading disability through pre-service and in-service training, and if every school campaigned for early identification of the problems, then there would be a much brighter outlook, a more hopeful prognosis, for the rehabilitation of these children.

PROBLEMS IN TRAINING READING SPECIALISTS

Marjorie Seddon Johnson
Temple University

The first problem one encounters in a consideration of the training of reading specialists is that of definition. What is a reading specialist? To say merely that he is a person specially trained in reading amounts to begging the question. One could have special training of many different types. Further, inquiries into the status of titles, responsibilities, and training of "reading specialists" have indicated that a state approaching chaos exists. No clear-cut job description and no specific set of training or experience requirements appear to have been associated with anyone of the multitudinous labels applied to personnel in the reading field.

One thing is obvious, however. The term "reading specialist" is applied at numerous levels. Differences exist in the professional preparation and experience necessary for qualification at these various levels. Therefore, one must determine for which specialty or specialties the potential "specialist" is training before a suitable program can be planned. No attempt will be made in this article to set up definitions of specialties within the reading area. Rather, procedure in training will be considered from the broad base of reading's place in the overall learning and functioning of the individual.

BREADTH OF REQUIREMENTS

Because reading is a complete process learned and carried on by individuals in varied situations, any reading specialist needs a good theoretical and practical background in numerous areas. There is no specialty in the reading field in which one could function adequately by merely being a technician of limited scope. Some jobs might not require that he be able to do a particular kind of testing, teaching, making recommendations or selecting instructional materials. However, he would likely find it necessary to use the test results in his planning, evaluate the teaching which was going on, follow recommendations which were made, refer for additional testing or request suitable materials. He would need in other words, more than a nodding acquaintance with everything involved with reading. What does this imply that he must know?

In psychology, some of the areas most important to one working in the field of reading are human growth and development, personality, learning, perception, and conceptualization. This means that one must also know the factors related to each so that they can be adequately considered from both the diagnostic and the instructional standpoint. Although not every specialist in the reading field needs to be a qualified clinical psychologist capable of giving psychological tests or providing therapy, for instance, every specialist must be able to understand the needs and problems of the people with whom he works.

In curriculum the reading specialist must see the setting for the reading program. Therefore, he must be aware of current developments in the total, on-going school program and the function which reading serves. Handling of reading as isolated from other facets of the curriculum can lead only to difficulty for both student and the reading specialist.

In language generally, segmentation of the program can be even more detrimental to progress. Achievement in reading rests on the development in oral language and becomes, with the oral language, the foundation from which writing ability ascends. Problems in development of ability in one facet of language has been found to exist not in isolation but rather in combination with difficulties in other facets. The reading specialist, therefore, must understand the sequences and interrelationships which exist in the development of language. He should understand the phonetic and the semantic structure of language. Only when he sees reading in its proper place in the overall language picture will he be able to deal with it successfully either diagnostically or instructionally.

In reading specifically, the specialist needs a thorough background in understanding of the abilities involved, developmental sequences, methods of diagnosis and instruction, and materials for both. Regardless of the particular part of the reading program to which he may devote his primary efforts, all of these elements will be involved.

In supervision, finally, there are many duties which fall to the specialist in reading unless the particular specialist is one who works directly with clients and does nothing else. He may be involved with the training and supervision of clinicians, for instance. He may be working with teachers in the classroom to help them improve the instructional program. In either case, he must understand some of the basic principles of effective supervision.

Acquisition of a good theoretical background in all these areas would not be sufficient training for a real specialist in reading. In addition to it, he must have a broad base of experience from which to work. What experience, in particular, seems essential?

In teaching, it seems evident, the true reading specialist should have a good background of experience. Included should be work at all school and age levels at which his specialist function will be performed. In order to be qualified, for example, to make recommendations to or otherwise aid the classroom teacher, he should know the program there from personal experience with it. In the same fashion, he should have had experience in the teaching of reading, on both clinical and non clinical bases. He should have worked with the developmental program and with both corrective and remedial cases.

In testing, too, the specialist should be experienced. The breadth of experience needed here would depend on the particular duties the specialist was to assume. Minimum essentials, however, would include individual and group testing in reading per se and experience in handling informal means of checking for related problems. Only on the basis of experience of this type could he function adequately in referring to other specialists for testing he could not do himself.

STATED REQUIREMENTS

Finally, certain specific requirements have been set down by various official or semi-official governing bodies. Where there are stated qualifications, the reading specialist's training must prepare him to meet them. Little consistency can be found in these requirements. In the state of Pennsylvania, for instance, one will be a quali-

fied secondary school reading teacher as of 1963 if he is certified to teach English and has six hours of credit in reading. To qualify as a teacher in a private school or clinic for reading instruction demands meeting more stringent requirements. In addition, the director of such a situation must be a qualified clinical psychologist as well as trained in reading. The Pennsylvania Psychological Association lists remedial education as one of the functions which requires holding a license for the private practice of psychology and, therefore, meeting extensive requirements. This variation in stated qualifications for people who might all be called, at least loosely, reading specialists make for considerable confusion in the training program.

RESPONSIBILITIES OF TRAINING INSTITUTIONS

The breadth of requirements for specialists in reading places many burdens on the training centers. There must be available all the resources necessary to provide the theoretical and practical background. The process of selection of candidates for training must be carefully controlled. At least within the training program there must be a clear differentiation of the capabilities demanded for the many types of specialties. Provision must also be made for research and evaluation of research so that the training keeps up to date and advances the general field.

PROVIDING RESOURCES

To make available the theoretical background described demands that a variety of courses be offered. Psychology, curriculum, language, and supervision, as well as reading per se, must be included in the program. Where these things are not available, no claim to training reading specialists can be made.

Acquisition of an adequate background of experience, though partly the personal responsibility of the trainee, also requires certain specific resources within the training setting. Facilities must be available for observation and supervised practice work in diagnosis. This would include synthesizing the results of all the diagnostic procedures, making recommendations, and preparing reports as well as doing actual testing. Likewise, observation and supervised practice work in the area of instructional procedures must be available with students at all levels of maturity who have severe reading disabilities and with those who need a minimum of help. In order to provide this kind of practice, the training institution must have a diagnostic clinic and a variety of types of instructional programs. There should be a full-time school program for those students whose problems are so severe that they cannot function in the regular classroom. Here the training in remedial techniques and in planning remedial programs can be gotten. In this setting, also, the trainee acquires experience with the hour-by-hour handling of the pupils whose problems are most complex. In addition the training center must carry on instructional work with pupils who do not need clinical instruction, but rather the kind of work that ideally should be going on in every classroom. Opportunities for working with students of this type, in a supervised situation, allow the prospective reading specialist to get needed experience in teaching advanced comprehension skills, versatility in approach to reading, study skills, etc., to those who have no basic reading disability but need such specific help.

SELECTING SUITABLE CANDIDATES

Not every individual is a potentially high caliber specialist. There is a real danger in carrying too far through a training program the person who will be a liability rather than an asset in the field of reading. Selection of candidates therefore becomes a problem which must be faced. Furthermore, as they move through the training program, there must be differentiation in the recommendations for use of their training. The particular capabilities required for the effective remedial teacher, supervisor, consultant, diagnostician, etc., must be recognized and candidates prepared to carry on in that phase of the work for which they show most promise. The final stages of training and experience as well as recommendations for jobs should be guided in terms of their specialties within the field.

SUMMARY

Preparation of personnel to meet the needs of work in the reading field is, of necessity, intensive and extensive in nature. All workers in the field need a broad base of understanding and experience from which to work. Each individual needs, in addition, intensive special training in the particular phase in which he can make his greatest contribution. Until there is some real clarification of the duties or responsibilities of the various kinds of specialists within the field, problems will continue to abound.

THE PAPERBACK IN THE HIGH SCHOOL

Joseph Mersand
Jamaica High School

In one of the twenty-seven short biographical miniatures contained in John Dos Passos' USA, there is a sketch of J. P. Morgan, the great financier. One sentence has always fascinated me:

> Every Christmas his librarian read him Dickens' A CHRISTMAS CAROL from the original manuscript.

You can easily imagine the powerfully built millionaire leaning back in his comfortable armchair, smoking one of his omnipresent Havana cigars and listening to Dickens' story of peace on earth and good will to all men from the only copy written in Dickens' own hand. Granted that he derived a certain amount of pleasure; yet I have always wondered whether Morgan could have derived more pleasure from this priceless manuscript that the poorest high school freshman reading the selfsame story in a 35-cent paperback edition.

Whenever I tell this story to my students, whether in high school or in college, I tell them that theirs is the opportunity to derive the same kind of pleasure from a modest investment of only a few cents for which J. P. Morgan expended a small fortune. There are certain delights from literature which they can get which might very well have been unkonwn to Morgan, powerful and wealthy as he undoubtedly was.

And this is the pearl of great price, I go on to say, that we teachers of literature are holding out to them just for the asking. For as James Russell Lowell so aptly expressed it:

> The benignities of literature defy fortune and outlive calamity. They are beyond the reach of thief or moth or rust. As they cannot be inherited, so they cannot be alienated.

Concerning the paperback in the high school, many terms have been used. Some call it a revolution; others call it an explosion; still others call it a boom. Without resorting to such high-pressure terms, I shall attempt in this paper to confine myself to the known facts, and to make some predictions based on these facts. Unlike Caesar, I shall not confine my Gaul to three parts, but to five:

1. What are the statistics about the use of paperbacks in the high schools?
2. What are the advantages of the use of the paperbacks, in the high schools?
3. What are some interesting projects going on throughout the country with respect to the use of paperbacks?
4. What do some outstanding publishers of paperbacks say about the situation?
5. A look into the future.

1. WHAT ARE THE STATISTICS?

To be quite frank, no one knows, and it would take a huge research project to determine the facts, which would be out-of-date al-

most as soon as the study was published. We cannot make even an educated guess. We do know that over 300,000,000 paperbacks are purchased each year, but we do not know how many of them are purchased by high school students.

Yet some statistics are available, and they are certainly impressive. William D. Boutwell, Director of Scholastic Book Services, writes that during the 1960-1961 school year more than 4,000,000 children in public and parochial schools purchased paperbacks regularly through more than 100,000 classroom book clubs. (1) Since some of these clubs are in elementary schools, we cannot ascribe the annual purchase of 4,000,000 copies to high school students alone.

John P. Ware, Educational Director of Pocket Books, Inc. indicates that in 1960 his company alone sold ten million paperbacks to schools or through schools. Here and there in the already growing magazine literature about paperbacks we learn of phenomenal purchases in individual schools. About all we can say is that paperbacks are being purchased and used by the tens of millions of copies by secondary school students, but we do not know how many or even what types.

That paperback publishers are making vigorous efforts to appeal to this market is evident from these excerpts from personal letters written especially for this occasion.

Victor Weybright, Chairman and Editor of the New American Library of World Literature, Inc.

> In the past year, NAL has greatly expanded the sale of its books for high school use, and we have dedicated our editorial program in the direction of greater service to young readers. Three quarters of the 120 Signet Classics which will be published by the Spring of 1962 are widely used in high schools. In January we will launch the Signet Science Library. . . It is our hope that the Signet Science Library will parallel the usefulness of the Signet Classics in high schools. (2)

And from the venerable House of Scribner, comes this comment from T. J. B. Walsh, Editor, Trade Department:

> All of us, from both "Trade" and "School" departments, keep up a steady search through our back list and our current list for titles suitable for use in the high schools to add to the Scribner Library. We are conscious of the problem at all times. . .
>
> We are much encouraged to pursue this course by the great number of letters which come in to us from high schools over the country setting forth their desires and needs in order to meet successfully the goals set in their various courses of study. (3)

Time does not permit quotations from many other paperback publishers relevant to the importance which they attach to this ever-growing market.

II. WHAT ARE THE ADVANTAGES OF THE USE OF PAPERBACKS IN THE HIGH SCHOOLS?

Perhaps the most intensive survey of the use of paperbound books in the public schools and the parochial schools was made in 1959 by a Subcommittee of the National Council of Teachers of English Committee on Relations with Publishers of Paperbound Books, and published in 1960 by the NCTE. Every state was represented as well as the District of Columbia and Alaska. The statistics of the use of these books you may read for yourselves but at this point I wish to list the advantages which were indicated:

1. Inexpensive
2. Sold in many places
3. Attractive
4. Encourages student home library
5. More copies available
6. Serve individual needs
7. Easily replaced
8. Students can own books
9. Can make notes in their own books
10. Inexpensive to replace in library
11. Good way of acquiring more current material
12. Broad range of material
13. Good translations
14. Enrichment of recreational reading
15. Handy for supplementary text
16. Many poor readers will read paperbacks
17. Flexibility of programming
18. Parents may also read books
19. Increase volume for small school
20. Students like them
21. Teachers can easily have classroom library
22. Channel students' allowances into wholesome areas
23. Cut, adapt and present facts without unnecessary detail
24. Easy storage
25. Book club benefits
26. Library can't furnish sufficient other copies
27. Students can exchange books with each other
28. Students buy more books
29. Can have new books each year
30. Prevent accumulation of books which are not reread. (4)

The list of advantages of the use of paperbacks in high schools is so inclusive that it would be difficult to find additional reasons in all the literature on the subject that has appeared either in magazine or book form. Incidentally, for those who wish to know the disadvantages as voiced by administrators, teachers, and librarians, these are also listed in the same pamphlet. (5)

III. SOME INTERESTING PAPERBACK PROJECTS.

Interest in the use of paperbacks on the part of high school students has been aroused in many ways. At first the way was led by the alert teacher, dissatisfied with battered old copies of textbooks, which were assigned to him, who ventured to order a set of paperbacks with fresher, newer materials. Gradually, more and more teachers saw the many advantages which were listed earlier. Even-

tually, entire English departments and schools decided upon paperbacks for the realization of their objectives. Today there are thousands of English teachers throughout the country who are using them as primary or as supplementary instructional materials.

An interesting experiment in an entire school system was The Buffalo Plan of in-school paperback stores, which was begun early in 1960. This has been so widely publicized nationally that I need not go into it here. In the two years since this plan was inaugurated in 1960 in Buffalo, well over 1,000 schools have established their own bookstores of paperbacks.

Book Fairs

Many schools have organized paperback book fairs at which they introduced hundreds of titles and permitted students to browse and purchase. Not only have thousands of copies been sold this way but small profits have accrued to the student organizations as well. Cooperating in these projects have been the local or regional distributors of paperbacks. For many students this was their first opportunity to purchase books and start their own libraries.

Library Paperback Collections

Many high school libraries have established paperback sections. One of the most interesting articles in paperback literature, describing how such a library was started is "I Sing of the Paperback" by Sister M. Clarencia, librarian of The Incarnate Word High School, San Antonio, Texas. (6)

Since library funds are never what they should be, the inexpensiveness of the paperbacks has been a contributing factor to their use. For special assignments, where several copies are needed, they have proven to be one of the best means of enriching the curriculum.

Classroom Libraries

The advocacy of classroom libraries, especially in English classrooms goes back at least thirty or more years. Like so many other worthwhile educational practices, this, too, remained as a good idea that could not be realized because of lack of funds. Today in thousands of classrooms, collections of paperbacks are utilized to enrich and supplement the regular program. Various devices are employed to stock these libraries, but the end result is more good books at hand when they are needed.

One could discuss some interesting curriculum modifications which have been made possible in our high schools because of the availability of paperbacks, but time and space do not permit; and references will be found in the footnotes. (7)

IV. WHAT DO SOME OUTSTANDING PUBLISHERS OF PAPERBACKS BACKS SAY ABOUT THE SITUATION?

Excerpts have already been read from two publishers of paperbacks. Many of their education representatives have been among the most knowledgeable in the field. They have attended innumerable educational conventions where they have met thousands of teachers, supervisors, and administrators. They discover what the needs are and try to bring ideas back to their editorial staffs.

Norman J. Elmes, Jr., Manager of The Education Department of Dell Publishing Co., has an interesting observation on the effect of paperbacks upon the parents of high school students:

> One of the most interesting sidelights in this paperback revolution is the tremendous effect that student reading has had on parents. The honest book consumption on the part of parents has spurted ahead noticeably. (8)

Freeman Lewis, Executive Vice-President of Pocket Books, Inc. and author of the sixteenth R. R. Bowker Memorial Lecture PAPERBOUND BOOKS IN AMERICA, takes this interesting view of the matter:

> It seems to be that the paperbound book is, at the moment, in a glorious, stimulating, ridiculous hodge-podge of a mess. Despite the mess, it would seem clear that the paperback has now become respectable for school use, and that the very multiplicity of materials available will provide a real bonus to school teachers and administrators, if only they can chart their way through the maze. (9)

Finally, Alexander M. Butman, Education Director of Bantam Books, Inc. sums up much of what has been said in this paper:

> The 'paperback revolution,' which had been going on since 1956, finally became an educational reality in early 1959. At that time the finest of the world's writings were available in inexpensive paperback editions.
> Today, through the efforts of the American Book Publishers Council, Committee on Paperbacks, the National Council of Teachers of English committee on paperbacks, and the realization on the part of the individual publishers of the needs of the educational market, this material's continuing availability is ensured. (10)

V. A LOOK INTO THE FUTURE

Many aspects of paperbacks in high schools I would have liked to discuss if there were time, such as the excellent lists that have appeared like Bypad's THE PAPERBACK GOES TO SCHOOL, N.C.T.E's BOOKS FOR YOU with starred notations for books in paperback form, and many other similar lists. Teachers can now easily find what is available in the area of their needs.

The following generalizations seem to me to be warranted on the basis of my experience as a teacher and supervisor for the past thirty-two years, and long before the first Pocket Book appeared in print:

1. There will be increasing use of paperbacks in all areas of the high school programs both for in-class and supplementary reading.

2. More school systems will list paperbacks together with hard cover books which administrators may order with school funds.

3. More high schools will establish paperback book stores along the lines of The Buffalo Plan.

4. The availability of many titles in paperback will permit more individualization and enrichment of instruction.

5. Paperback publishers and educators will work more closely together so that the most needed titles will be made available.

6. More paperbacks will either be written or edited with the high school student in mind.

7. Because many retarded readers have shown more interest in the paperbacks than in the traditional textbooks, I believe that the paperback will play an increased role in developmental and remedial programs.

8. The interest developed through reading paperbacks will be transferred to other types of reading -- the hard cover, the better type of magazine, and the newspaper.

James W. Sanders, S. J. expresses this thought so well at the close of his article, "Soft Covered Culture" in November 1959 CATHOLIC EDUCATOR:

> The fact that high school students are reading, enjoying, and appreciating books . . . and asking for more of them, seems to prove beyond doubt that the average high schooler is capable of good reading if he can be brought into contact with it. The wealth of highest caliber literature at the lowest possible prices and in the most convenient and persuasive form made available by a paperback reading program can, perhaps, be the most successful means of establishing that contact, a contact destined to develop a solid appreciation of the finest in the world's culture.

Footnotes

1. William D. Boutwell, "The Paperback Boom!" STUDIES IN THE MASS MEDIA, December 1961, p. 9.
2. Letter to the writer, dated December 19, 1961.
3. Letter to the writer, dated January 26, 1962.
4. THE USE OF PAPERBOUND BOOKS, Champaign, Illinois, National Council of Teachers of English, 1960, pp. 19-20.
5. IBID. pp. 18-19.
6. In The CATHOLIC EDUCATOR, March 1961.
7. See Albert Nissman "Potpourri on Paperbacks," STUDIES IN THE MASS MEDIA, December, 1961, pp. 6-8.

8. Letter to the writer, dated January 10, 1962.

9. Letter to the writer, dated January 24, 1962. See his PAPERBOUND BOOKS IN AMERICA, New York. The N. Y. Public Library, 1952.

10. Alexander M. Butman, A MAJOR EDUCATIONAL PROBLEM.

INSTRUMENTED APPROACHES WITH KITS

Stanford E. Taylor
Educational Development Laboratories

The topic I have been asked to speak on today is teaching reading with kits. The word "kit," according to the dictionary, means a collection of tools or supplies gathered together for a specific purpose and usually housed within some sort of container. The completeness and the organization of kits prepared for teachers are key qualities, for they offer the average and above-average teacher a more direct, and usually more effective means of instruction in certain areas. Unfortunately, the same kits, when used by a poor teacher, are often abused, in that the kit becomes a substitute for his own teaching and sometimes even becomes a total program.

The kit I am going to tell you about today is the Study Skills Library, a collection of materials and exercises designed to provide instruction in vital study skills and to assist in the improvement of reading in the content area. The Study Skills Library is planned as one part of a total reading program that deals with the following skills and abilities:

1. Perceptual Skills:
   Identification, recognition, and association of printed symbols with meaning

2. Visual Functioning:
   Binocular coordination and motility

3. Word Knowledge:
   Central and transferred word meanings in contextual settings

4. Word Attack Skills:
   Structural and phonetic analysis

5. Comprehension Fundamentals:
   Recall, understanding, organizing

6. Interpretation:
   Concluding, comparing, predicting, sensing, visualizing

7. Analytical Reading:
   Minute detail and over-all structure

8. Critical Reading:
   Relevancy, accuracy, validity, significance

9. Reference Skills:
   Location of information
   Usage of materials

10. Selective Reading:
    Skimming
    Scanning

11. Guidance in Reading:
    Attitudes, habits, interests, taste

12. Allied Communication Skills:
    Listening, speaking, and writing

In the Study Skills Library there are provisions for stabilizing and extending students' vocabulary or word knowledge. In addition, these materials develop a thoroughness in reading, the ability to recall, as stated, many of the facts and ideas presented, and to follow the author's line of thinking with competence--qualities and abilities we term comprehension fundamentals. In addition, the student is guided in his ability to go beyond the ideas of the author and to interpret, to analyze, and to read critically. Further, he is given specific instruction in the ways and means of locating information and in the efficient use of reference materials.

As you might suspect, a program that attempts to develop these skills and abilities would, because of its very nature, need to be individualized for maximum efficiency. The Study Skills Library, therefore, was planned as a multi-level, self-instructional program. The program is designed so that the student can work at his own pace and level, progress through the sequence of study skill development from the simplest understanding to the most complex, with detailed instruction and with adequate correction or reinforcement at each step.

The study skill areas and the specific skills to be taught at each level were determined on the basis of a survey of professional texts in reading, and conferences with numerous reading consultants. Six major study skill areas are considered: following directions, interpretation, evaluation, organization, retention, and reference (locating information). Following directions is given continuous emphasis in all study skill lessons. Retention is an outgrowth of the application of the other skills. Each of the four major areas is broken into the specific skills listed below.

INTERPRETATION

Detecting author's purpose
Drawing conclusions
Making comparisons
Making inferences
Predicting outcomes
Sensing Cause and Effect
Visualizing

EVALUATION

Judging relevancy
Noting significance
Recognizing validity
Verifying accuracy

ORGANIZATION

Becoming aware of sentence structure, paragraph structure, and structure of total selection
Finding main ideas

Selecting details to support main ideas
Determining chronological and sequential order
Outlining
Summarizing
Classifying
Representing graphically

REFERENCE

Using alphabetical order
Using parts of a book:
title; title page; copyright page; acknowledgments; preface; table of contents; lists of tables, charts, and illustrations; chapter and sectional headings; side and recurring headings; footnotes; illustrations, graphs, diagrams, and charts; captions, picture credits; chapter or section summary; bibliography; glossary; appendix; index
Using reference material:
dictionary, encyclopedia, world almanac, atlas, maps, and globes
Using library facilities:
card catalog; Reader's Guide, etc.

The STUDY SKILLS LIBRARY is based on a subject-level approach: each box represents one reading level in science, social studies, or reference skills, with a total of three boxes for each level. Each subject-level box contains ten lessons of comparable difficulty. Each of the lessons is accompanied by seventy worksheets and an answer key.

The topics of the selections used in the science and social studies boxes are those most frequently taught at the particular grade levels, as determined by a survey of state curricula. The selections themselves are adapted from the most widely used subject-area texts.

A total library within any given classroom would desirably contain boxes down to one year below the lowest reading ability in the class. Thus, one classroom might have as many as 15 to 18 boxes in order to cover the reading ability range of the students and to provide materials covering the three areas of science, social studies, and reference skills.

Because this program is largely self-directed, and because students benefit from a high degree of success, it is important that each student be started on material at least one year below his instructional level in reading. In determining instructional level, the teacher should consider reading performance in classroom work, results of any informal appraisals, standardized reading test results, and general success in the areas of science and social studies.

In carrying out a Study Skills lesson, the student would go to a box on his level, usually rotating the science, social studies, and reference boxes, draw out a lesson folder and a worksheet, and take these back to his desk. After completing a part of the lesson, he would return to the box and draw out an answer key with which to correct his work. Each time a lesson is completed, the student fills in certain information in his Study Skills Record.

To help you better understand a Study Skill lesson, I'd like to take you through the orientation lesson that is carried out with the entire class before starting to use the Study Skills Library. This orientation lesson serves levels four, five, and six and is typical of the lessons found in the science and social studies boxes.

STEP ONE – Readiness

The title, the cover illustration, and the question beneath it stimulate the student's interest, arouse curiosity, and initiate purpose. Study of the vocabulary section creates familiarity with words that play a key role in the selection. These words were selected according to one or more of the following criteria: they are above level according to EDL's Core Vocabulary: they are used in a special subject-related sense; they are important subject-area words, as indicated by a survey of major textbook glossaries at that level; they have not been introduced in a lower level library. Each key word entry is similar to a dictionary entry in that syllabication and pronunciation are given, and the word is defined and given in an example sentence in the sense in which it is used in the selection.

Next the student surveys the selection according to specific suggestions given, noting headings and sub-headings, studying illustrations and captions, and reading key sections of the selection. It is important to note that the survey directions vary from selection to selection according to the selection's structure, typographical aids, and illustrations, so that the student learns to adapt his survey approach according to variations in content.

After completing his survey, the student reads two or three purpose setting questions at the beginning of the selection. He has learned that a little thinking about the selection on his own and the careful fixing of these questions in his mind before he reads will help him to answer the comprehension questions that follow the reading of the selection.

STEP TWO – Purposeful Reading

Next he reads the selection carefully and accurately. The selections have been scaled for approximately five minutes' reading time according to grade level norms for reading rate.

The student then answers questions about the selection, entering the answers on his worksheet. The questions are coded so that the student is aware of the type of comprehension being asked for, and so that the teacher can determine whether the student is having more trouble with some types of comprehension than with others. The questions that are not marked are recall questions, asking for information as stated. Those that are circled are main idea questions. The triangle indicates that an inference must be made. The square shows that the question will deal with information contained in an illustration or caption. After answering all the questions, the student scores himself, using the key on the back of the worksheet.

Now the students are ready for a Study Skill lesson. This particular lesson deals with finding sequence. First the student is told what sequence means; then he is given several examples of how sequence is determined.

Next he turns to his worksheet and completes an exercise on finding sequence. Then he draws out an answer key and corrects his work. Sometimes when a student has a particularly difficult time and makes a number of mistakes, he finds it more satisfying to draw another worksheet and complete the lesson again. He has been urged not to proceed to the second side until any mistakes on the first side have been corrected and he feels sure he knows why he made his mistakes.

The second side of the worksheet contains a continuation lesson that provides more practice with the same skill. After the student completes the worksheet, he corrects it with the answer key. Then the student records his performance on this lesson in his record folder. He fills in the date, the lesson number, plotting off his comprehension score and noting whether he got the coded questions right or wrong. The check in the Study Skills box indicates whether he has completed it satisfactorily.

While a student works on his own most of the time, he knows he can call on the teacher for explanation and help at intervals. Certain worksheets will call for the student to write sentences and paragraphs which must be evaluated by the teacher as satisfactory or needing further work.

You've just completed a lesson dealing with sequence. In one box, students would be reading about such topics as "The Wonderworld of Chemistry," "Animals and Plants," "Looking into Matter," "Sources of Water," "Space Neighbors," and "Your Nerves," and learning to use such study skills as finding cause and effect, selecting subtopics, reading an experiment, comparing, making a summary, visualizing, verifying an outline, classifying, outlining, and understanding paragraphs.

The completion of a Study Skill lesson requires from 25 to 45 minutes. It is desirable for students to complete two lessons per week to provide continuity to their Study Skill program, and for each student to complete 60 lessons per year, working his way through the three boxes below his level and the three boxes on his level. The next year, the student would complete 30 lessons, the three boxes on his level, and might proceed above his level.

In this program, not only does the student grow in his reading and study skills, but he also grows in his ability to work independently and to evaluate his own efforts critically.

The understanding developed in the Study Skills Library can and should be extended to students' daily work. Aditional teacher-directed lessons, based on the approach used in the Study Skill lessons, can be developed with the students' regular subject area texts.

The Study Skills Library can also be used diagnostically in determining areas or skills in which several students or a large group may need special help. When this occurs, a group presentation may be called for. Here again, lessons can be based on students' subject area texts, using the Study Skill lesson as a guide to format.

Presently this library extends from grades four through six, with grades seven through nine nearing completion. The Study Skills Library is planned as a ten- to twelve-year sequence, starting with first grade.

I think the most revealing statement about the effectiveness of this program came from a sixth grade boy who, on completing one of the exercises, said, "Man, these stories really make you think!"

THE PHILOSOPHY BEHIND THE MACHINE APPROACH TO READING

Mabel S. Noall
Science Research Associates

The Chinese criticize Americans for their efficiency. It is not that the Chinese mind getting things done. The trouble is that American efficiency leaves no time for leisure, and it frays the nerves when things must be done perfectly. When Americans build a bridge, they plan so well that the two ends come together within a fraction of an inch. When two Chinese begin to dig a tunnel from both sides of a mountain, they both come out on the other side. The Chinese think it doesn't matter as long as a tunnel is dug. They relish the slow easy rhythm of their ways and abhor the hard life and hectic pace Americans set for themselves. They feel that American efficiency imposes a different concept of time as measured by the clock and eventually turns human beings themselves into clocks. It just makes life not worth living. (11) A few Americans may agree, but most of us have an abiding faith in efficiency.

It is this drive toward efficiency that has created machines to speed up reading. It is this belief in speed in getting things done that is the driving power behind the machine approach to reading.

THEORY OF SPEEDED READING.

If a reading program did nothing more than increase speed of reading without lowering the percentage of correct responses, it would have recognizable merit. As long as the percentage of correct responses remains the same, the faster reader will gain more information in the same period of time than will the slower reader. Even in the primary grades, if difficulty and error are held constant, an increase in speed is evidence of growth in reading. Speed is important. When all other things are equal, speed in reading, in skimming, in studying, in organizing, and in all kinds of working relationships gives advantage to the faster individual. This is especially true in our competitive culture. Experience shows too, that almost anyone who practices to read faster, succeeds in reading faster. All speed reading programs reported in the literature seem to be successful.

The importance of speed, coupled with the very strong likelihood of speed through practice, leads to the conclusion that some kind of speed development should be a part of any reading program.

Moderate speed-up in reading often brings better comprehension. Pacing, or time pressure, helps to sustain attention. When the eyes are traveling rapidly over the printed page, the ideas in the material tend to crowd out extraneous thoughts and to engage the attention. Pressure of ideas is added to the pressure of time limits, and comprehension grows with heightened attentiveness. In faster reading more effort must be expended to grasp and organize ideas; this increased effort induces a more active state of thinking. Nearly all poor readers perform better on appropriate reading tests than they can be expected to perform on their own when they are under less supervision. The continual refocusing of the attention through the use of short-term tasks and frequent questions probably plays a part in this rise in performance, but part of the explanation lies in the time pressure.

The machine approach to reading rests upon this recognition of the importance of speed and an analysis of the reading process. Since we do not agree on what reading is, our analysis of reading differs. The philosophy of reading he holds influences the way the researcher goes about his analysis of reading. Researchers with the view that reading is primarily a motor process of perceiving or recognizing printed symbols have photographed eye movements during reading. An analsyis of these photographs indicates that there are different patterns of fixations, rhythmical progress in number and kinds of fixations, return sweeps from the end to the beginning of the next line of type, and regression when understanding is not clear. To the accurate recognition of words, researchers with a broader concept of reading add the idea that reading includes fusion of the specific word meanings into patterns of related ideas. These researchers have investigated the relationship of rate to comprehension and the factors which influence this relationship. A third group considers reading as not only perception and recognition of meaning, but also as critical reflection upon, and use of, the author's ideas. Researchers holding this philosophy have concerned themselves with the whole matrix of mental processes and the physical, psychological and social factors which influence this complex organization of reading activities.

In a machine age, it is natural that machines have been developed to teach reading. Naturally, too, the philosophy of researchers, who have held these somewhat divergent views of the reading act, has dictated the development of several different types of machines to teach reading. These machines fit the conditions uncovered by research as significant to the reading act, but always it is the reading act as the researcher views it.

This means that if you hold a mechanistic view of the reading act, you will want a machine which speeds up and widens visual perception, which controls and regulates eye-movements, which trains the accurate return sweep of the eye, and which inhibits regression. If you believe that comprehension of meaningful ideas is the most crucial factor in reading, your machine must fit individual differences in rate of comprehension, provide for different organizational patterns of thought in the reading material, and allow for different techniques of synthesis in the thought-getting through reading. If you believe that reading includes the whole matrix of the reading-thinking act you are concerned with the machine's ability to provide for variability in motives within the reader, for variety in organizational patterns and content of the material, for selectivity and evaluation of materials, and for constructive attitudes toward reading.

Because we have not agreed on what reading is, we can have no common agreement about the machine approach to reading.

MACHINES TO SPEED READING.

There are five types of machines to speed reading now available, and a sixth type of machine may be in the incipient stage of its development. These machines are designed to fit the different philosophies of reading.

The first two types of machines are geared to speed up the oculomotor process of reading. They are used primarily by those who embrace the more mechanistic concept of reading. These machines are tachistoscopic in nature.

One type of machine, including the Tach-X (10), the Keystone Tachistoscope (5), the Tachist-O-Flasher (9), and others, is designed primarily to speed up and widen the perceptual span. At least for the time the machine is in use, it demands attention and, thereby, heightens the possibility of accurate perception. Usually numbers, symbols, words, or phrases are flashed in controlled brief exposures. After a few practice sessions, many people can easily and accurately repeat three- and four-word phrases exposed at the speed of 1/100th of a second. Multiplied out, and assuming no eye movements were needed, this implies a theoretical perception speed of 18 to 24 thousand words per minute. Of course, eye movements are needed, and interpretation of what is perceived is necessary. Therefore, actual reading speed is probably never equal to this theoretical perception rate.

The second type of tachistoscopic device is designed to control eye-movements. This type includes the Harvard Films (4), the Controlled Reader (1), and others which project connected text in short phrases for very brief exposures of time. Comprehension tests can be, and usually are, given at the end of each story or filmstrip. These machines are designed to regulate the eye movements and to control fixations and the return sweep to the beginning of the line. They force the reader into a set pattern. They permit no regression and no deviations from the pattern, but they do provide for variation in the over-all rate of exposure and give some latitude on the amount of the material per exposure. A few machines, such as the Craig Reader (2), can provide both types of tachistoscopic practice with one machine. Ideally, these machines should be used in individualized practice; but due to cost and operation problems, generally they are used with groups or entire classrooms.

The other three kinds of reading machines now available fit the philosophy which believes reading is primarily centered on getting meaning from the printed page. In line with this philosophy, the controls are set to permit some variation in rate and method used to gain comprehension even when over-all rate is fixed.

One kind of device merely measures the time used in reading. A clock with a sweep second hand, a stop watch, or the Elapsed Time Indicator (3) are examples of this time-measuring equipment. Devices of this nature furnish the least pressure for speed of any of the five discussed here, and for many students they work well. If there is only a short time before a task must be finished, students do not waste as much time getting started. In addition, readers find the race against the clock in competition with themselves stimulating. All of these devices can be used with individuals or with groups. The stop watch works best on an individual basis, but it can be used with groups when the timing is kept uniform and the improvement measured on a given task. With the clock, it is necessary for each individual to keep track of starting and finishing times and do some computation; all of these tasks are eliminated with the Franklin Elapsed Time Indicator (3).

The fourth kind of machine paces the coverage in reading. The Rateometer (7) and the SRA Reading Accelerator (8) are examples of this device. A bar or plate or shaft of light moves down to cover the lines of reading material in the book at a controlled rate. This rate can be regulated to the speed desired by the reader to fit varying type sizes, format, and reader comprehension rates. With some

of these machines the plate which covers the page does not permit the reader to look back. All of them permit a choice of regular rhythmical reading pace, skimming ahead, and some slight opportunity for hesitation on less familiar words and ideas. Although they discourage it, a few even permit backward glances on material just read. These machines are all designed to be used by individuals.

The fifth technique is based on an intermittent timer called the Mahal Pacer (6). It was designed to permit an individualized speed-building program with large groups at low cost. The device is usually set to trigger a short ring at one-minute intervals. This allows for variable starting and finishing times on different reading levels, skills areas, and reading tasks. The reader is informed where he should be at the end of every minute. In this way he can check his over-all reading rate and, at the same time, use a fluctuating speed of perception and association when unfamiliar elements multiply. In reading connected text, slow readers use page markers placed along the margins of the book; faster readers place slip markers at intervals between the pages. The chief advantage over the clock is that the reader has no computation to make and that the reader is paced by being reminded, at one-minute intervals, where he should be to maintain his speed. The advantages over the accelerator are lower cost, greater possibility of variety in materials and assimilation techniques, more natural reading situations, and wider use by groups with individual needs met.

To date, no machine has been devised which fits the third and the broadest philosophy of reading. There is some indication that a machine might be built which would fit, at least, a part of this concept of reading. Recent developments in programmed instruction which follow branching rather than linear lines, could be combined with pacing. When a student is told immediately after each query whether his answer is correct, the fact that he knows how he is doing helps him steer his path closer to the desired goal. It is reasonable to assume that this motivation also develops when the student is told at frequent intervals where he should be to maintain his speed. This technique of immediate knowledge of results is a very important characteristic of automatic teaching. A machine might be developed which would combine pacing, immediate scoring of results, and redirection of learning in line with the speed and comprehension results. This machine has yet to be perfected.

It also is evident that the philosophy a reading teacher holds will determine the choice, the method, and the extent of use of machines.

PROBLEMS POSED BY THE MACHINE APPROACH TO READING

1. Some machines are so engrossing that they focus attention on the process rather than the content of reading. This is a serious problem. The machine's involvement with process prejudices many people who think of reading as getting thought from the printed page.

2. There is danger that the machine used to build speed may by used with readers indiscriminately. Readers who have very poor comprehension and who lack the basic word recognition skills, are harmed by speed-building with machines. In recent years, many educational clinics have had referrals of children whose reading problems have been aggravated by a program of speed development.

3. There is the problem of promoting depth of comprehension along with speed development. This problem can be solved very satisfactorily by two techniques: First, high speed reading can be properly restricted to factual material, surveys, and superficial coverage, and slower speeds can be reserved for literary materials that are read for esthetic enjoyment. Secondly, rapid reading for facts can be followed by critical evaluation of the content.

4. Machines pose technical problems of initial cost, accounting and maintenance. Administrators must ask if the machines justify the cost and bother.

5. Machines can become straight-jackets that regiment thinking. Too often, materials are stereotyped to fit a machine rather than the machine adapted to the varied materials. Again, there is the tendency to ask readers to fit themselves to the machine and its demands; rather, the machine should be asked to fit the individual reader's needs.

6. Machines are devices to be used for the improvement of reading skills. Eventually, if the student is to become an independent reader, operating under his own discipline and motive power, he must discard the machine. How is this done? Does the machine-induced power stay with the reader when he reads on his own? This can be a problem unless practice leads to independence.

7. There is always the problem posed by speed building programs. How much pressure for speed is good? Frequently, people learn to dislike reading when too much of a business is made of rapid reading. It is possible that the use of the machine can be overstressed. There is a very real risk of developing a nation of rapid non-readers.

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PROGRAMED INSTRUCTION AND THE IMPROVEMENT OF READING

David A. Sohn
The Center for Programed Instruction

Dr. Susan Markle of the Center for Programed Instruction was recently at a party where she met a person who works in the field of Educational Television.

"So you're in the programed instruction game," said he. "Well, we thank our lucky stars for you folks. Everybody used to be on our backs, but now they're all mad at you and they leave us alone so we can get some work done."

Since the major point I would like to make today is that a person who works his way through well-constructed programs will, by doing so, improve his reading ability, I will show a sequence which Dr. Markle wrote in the area of critical reading later. I would also like to emphasize that one of the better ways to illustrate what we mean by programed instruction is to read good programs. I have distributed to you various samples of programing or "near-programing." My intent is not to endorse these samples as either good or bad examples but merely to give you an idea of some types of programing, good or bad, that are being used today. The only fair way to evaluate a program is to work through all its frames, not just a few. Too many make the mistake of judging a program after looking at a few frames. You should not skim a program.

There is a great deal of confusion about programed instruction today. The sequence by Dr. Markle, call "The Slanting of Facts through the Use of Loaded Words" is appropriate when we think of what Madison Avenue has done for the image of programing. I sometimes fear they have run programed instruction up the flagpole and into Never-Never Land.

I read recently an ad which guaranteed that a teaching machine would raise your child's marks or your money back. They also added that your child's initials would appear in gold on the machine. A week later I read an ad which guaranteed that you would get your money back if you did not master the subject matter involved in a new kind of "teaching machine textbook." This ad said there had never been, to their knowledge, a guarantee like this. In the same issue of the paper, I saw a picture of a striking piece of sculpture which appeared to me to be a two-faced man who was struggling to escape from behind enormous stone bars. This firm announced the opening of a new kind of school – the first new approach to learning at home in 50 years – and it also claimed to be the first, mind you, to offer easy to assimilate teaching machine programed learning. What the symbolism of the petrified jailbird was intended to communicate, I do not know, though I recalled a poll we once ran at the Center for Programed Instruction concerning what the receptionist should say when she answered the phone, and one wag suggested she say, "Help! I'm trapped inside a teaching machine!"

Guarantees are attractive! About all I can guarantee is that I understand why many thinking people find the slick picture of a machine teaching children repulsive. I can also guarantee that in the machines I have seen, it is the program that does the teaching, good

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or bad, not the machine. The program presents the information and it is no better than the skill and knowledge of the programer who constructed it.

And how new is this flashy "teaching machine automated programed instruction speedy learning" method? Probably the first caveman who taught something well to a friend used most of its principles. Susan Markle says that a program teaches "by age-old methods of telling the student what he should know or carefully leading him through the steps of discovery. Textbooks and teachers have always done this." (1) Unlike traditional textbooks, however, a program asks the student to use his new knowledge with each step, as a good tutor does. The student is immediately involved, he responds to each new step of information, and he knows immediately whether his answer to a question or problem is right or wrong. Since good linear programs are designed so that the student will be challenged and yet probably get the right answer, the resulting feeling of success aids his learning.

Who were, in fact, some of the first to use most of the principles of programed instruction? Many of these "revolutionaries" are not living now — in fact, they have been dead for some time. Good examples are Socrates, Quintilian, and Comenius. They were all good teachers and, if you will, programers. In Plato's THE MENO, Socrates leads a student to solve a mathematical problem step by step and then he says to his friend, Meno: "So a man who does not know has in himself true opinions on a subject without having knowledge. At the present, these opinions, being newly aroused, have a dream-like quality. But if the same questions are put to him on many occasions and in different ways, you can see that in the end he will have a knowledge on the subject as accurate as anybody's. This knowledge will not come from teaching but from questioning." (2)

Two thousand years ago, Quintilian, the world's first public school superintendent, said: "Do not neglect the individual student. He should be questioned and praised . . . He should strive for victory, yes, but it must be arranged that he gains it. In this way, let us draw forth his powers with both praise and rewards." (3)

And among the rules for good teaching given by Comenius in the seventeenth century were these: 1. All things should be taught in due succession and only one thing at a time; 2. Whatever is taught should be taught straightforwardly, and not in a complicated manner; 3. A subject should not be left until it is understood; 4. Learning should proceed from the known to the unkonwn; 5. Instruction should be fitted to the comprehension of the learner; and 6. Children must learn by doing." (4)

Therefore much of this new mousetrap is based on solid methods which have been known and used by the best teachers for centuries, and the machine itself emerges as the hardware which surrounds the engine of this instructional method. . . the program.

Let us look at a sequence of frames from a program by Dr. Susan Markle. Dr. Markle is author of WORDS, a soon-to-be-published vocabulary program that was written, revised, and tested over a period of five years. She is also senior author of the PROGRAMED PRIMER ON PROGRAMING and recently wrote an article called "Inside the

Teaching Machine," which appeared in the SATURDAY REVIEW, both of which are excellent explanations of the programing process. A remedial reading teacher who became an experimental psychologist, Dr. Markle was one of the first programers in the modern sense of the word. She worked at Harvard under the direction of B. F. Skinner. This sequence is, as I said, "The Slanting of Facts through the Use of Loaded Words." The author has previously taught what a fact is, what an opinion is, and how to judge the validity of a fact and the basis of an opinion. Here the author brings the two together.

What are the implications of programed instruction for the improvement of reading? I feel that there are many, some as yet undiscovered. I will discuss a few that I feel are important. As I said, I take the broad view that by working through good programs in various subjects, the student will learn to read better. The major reason for this opinion is that due to the nature of programing, when the teacher-programer actually programs his subject, he must teach the reading of the subject as well as its content. Whereas a lecture, for instance, can be delivered and few in the audience may understand it without the speaker realizing this fact the programer constructs and edits his program by observing the behavior of students who work through it and discovering where he has taught poorly. If the student misunderstands, it is usually the fault of the programer, not the student. The programer revises until he is certain that he is teaching his subject, and through doing this, he also teaches the reading of his subject. His program is unsuccessful if he does not. As the student works his way through SETS, RELATIONS, AND FUNCTIONS, for example, he learns more about reading mathematics, and this type of reading improvement is true if he completes a good program in logic, statistics, French, or any other subject.

Dr. John Blyth of the department of philosophy and religion in Hamilton College cited in a letter this example of how reading habits can be affected by going through a program:

> I agree thoroughly that the use of programmed materials should be helpful for the improvement of reading far beyond the elementary levels. In our logic program we discovered that some of the techniques we were using did in fact help to modify the perceptual habits of the students. In the logical analysis of an argument stated in English, it is unfortunately true that there is no one to one correspondence between the grammatical elements in a sentence and the logical elements. Nevertheless, in order to make a correct logical analysis they must learn to discriminate and recognize the logical elements. To aid in the recognition of these elements, we used a familiar device of bracketing the relevant parts of the sentence. In addition we used logical symbols to represent the logical elements. The effectiveness of this technique in modifying their perceptual habits was suggested by the comment made by one student. He said, "When I read anything now, I see those ----p's and q's all over the page.(5)

Programed instruction can also help students to learn the special languages of new disciplines they encounter in both secondary school and in college. If a student must learn the special vo-

cabularies and styles of the economist, the chemist, or the professor of English, these adjustments can be put into programed form. The statistical mean of the psychologist, the golden mean of the philosopher, and the means to an end of the political scientist must mean to the student what they mean to the specialist, and sometimes this is no mean trick. Lewis Carroll has commented on the problem:

"When I use a word," said Humpty Dumpty in a rather scornful tone, "it means just what I choose it to mean – neither more nor less."

"The question is" said Alice, "whether you can make words mean so many different things."

"The question is," said Humpty Dumpty, "which is to be master – that's all."

And the unfortunate result is that the mastery of the Humpty Dumptys in the academic world frequently forces captive students to bear the unnecessary yokes of scrambled understanding. One good example of how programing can help such a problem is Holland and Skinner's programed text, AN ANALYSIS OF BEHAVIOR. Then read the programed text which Harvard students are required to complete as part of the psychology course. After this reading, read SCIENCE AND HUMAN BEHAVIOR again. Your comprehension will, I predict, improve immensely, not so much because you have read SCIENCE AND HUMAN BEHAVIOR twice as because you have learned Skinner's special terms, his style, and his method of communicating.

Related to the problem of special vocabularies and styles is the problem of learning new approaches to subject matter. The revolutionary changes which are occurring in the teaching of mathematics, physics, chemistry, English grammar, foreign languages, and other areas are causing curriculum problems throughout the country. I submit that programing can help both the teacher and the student to make the necessary transitions and shifts in perspective from the traditional to the new. Mr. Bernard Everett, Assistant Superintendent of Schools in Newton, Massachusetts has pointed out that one of the major bottlenecks in introducing new subject matter into the curriculum is the re-education of teachers. Obviously if the teachers do not understand new approaches to their subjects, students will have difficulty understanding them.

Programing can also be used to review concepts previously "learned". Prerequisites for a course can become quite vague and in need of refreshing. Dr. H. R. Crane of the Physics Department, the University of Michigan, gives this example of how programing can help:

> Many students who begin physics are deficient in such skills as geometry and trigonometry even though they have had these subjects at some time in the past. This gives them a severe handicap in respect to the other members of the class. Rather than take class time for remedying these deficiencies for a few students, I have prepared several brief programs which can be assigned to them as homework. The programs are given only to students who show deficiencies. Student reaction is very favorable and the results, as far as curing the deficiencies is concerned, seem to be quite encouraging.(6)

One of the principles of good programing is to begin where the student is and to lead him forward from there. If you assume more than is in his repertoire, he will have trouble. When we deal with large classes, we have to strike a medium which some students will inevitably fall below. One can see many possibilities for using the programed review technique.

The broad area of the comprehension of written words, whether it be a paragraph, a poem, an article, a chapter, or a book, can be strengthened through programing techniques. For example, Professor Hugh Barbour of Earlham College has programed what he calls "questionnaires" or passages from books of the Bible which help students to interpret their reading. Dr. John Blyth of Hamilton College has also programed Locke's THEORY OF KNOWLEDGE. He says:

> It illustrates the approach to another kind of reading problem. Instead of simply analyzing straight arguments, I am concerned in that program to develop facility in the analysis of an extended argument. (7)

The student reads a specific section, or even a paragraph of Locke, then works his way through the analysis of his argument. One can see possibilities for programing the different interpretations scholars may have of many types of prose and poetry.

At the Dartmouth Medical School, Dr. Edward Green and other colleagues are programing both review sections and teaching sections of gross anatomy, pharmacology, and other subjects.

Dr. James Brown, Professor of Rhetoric in the University of Minnesota and Chairman of the Committee on Reading Comprehension of the National Society for the Study of Communication has commented on paragraph comprehension in relation to programing:

> I would expect programed instruction to be particularly helpful in teaching students to read paragraphs. The various structural parts of a well written paragraph should become clearly sensed after working through some samples with care and in depth. (8)

In addition to building strength in reading comprehension through programing, many other aspects of the "reading and study skills" field may welcome programed techniques. So often we speak of "reading skills" in the abstract. Programing forces us to be specific and concrete in determining what the end behavior of a student should be after he has worked through a program. Though there is a vast constellation of skills in the reading field open to the programer, one of the problems will always be how to determine exactly what you want to teach the student and, once it is "taught", how to test to see how well you have taught it. There is a lot of work that can be done with almost any reading skill you can name if the programer has the time, the knowledge, the skill, the patience, and little regard for his sanity.

In conclusion, let me repeat that I have touched upon a few broad implications that programing has for the improvement of reading. Experience thus far seems to indicate that merely working

through good programs can help the student to read with greater understanding. Programing can help him to learn the special languages and styles of subjects and new approaches to teaching subject matter. It can help him to review rusty concepts and skills of subjects previously studied. It can help him to see different interpretations of a specific example of literature or to comprehend many types of prose or poetry. And almost every "skill" we teach formally in the reading field could be taught with programing techniques.

Dr. James Brown comments in relation to the overall potential of programing:

> I am convinced that programmed instruction is the most promising development on the horizon for the teaching of reading skills and word analysis techniques. (9)

In connection with Dr. Brown's comment, it is intriguing to ponder what the effect of programing will be on a student's reading ability twenty years from now. At this crude, beginning stage, we are working with students who are accustomed to reading traditional textbooks and who must make the transition to this new way of teaching. In 1982 what kind of reader will a student be who reaches the senior year of high school and who has worked with programs, as well as with other materials, since kindergarten? Will he be a more careful analytical reader. Will his vocabulary be larger? Will his understanding of semantic subtelties be greater. What effect will programing have on his rate of reading?

This new teaching approach opens great and challenging areas for research. And each good program is an additional step toward shaping more mature readers. Certainly programing offers fresh hope for the neglected retarded reader and stimulating opportunities for the capable or superior student. For the curious and industrious teacher of reading, it offers a great amount of work, challenge, and discovery, plus immense satisfaction when he sees students read and truly learn. Teachers of reading and study skills cannot afford to ignore the progress and promise offered by the discoveries and achievements of programed instruction.

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